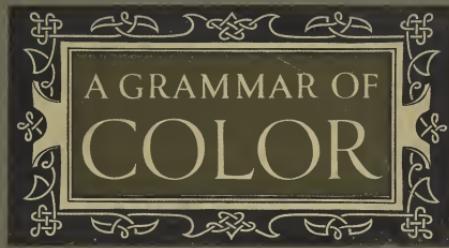


A
GRAMMAR
OF
COLOR

STRATHMORE
PAPER
COMPANY



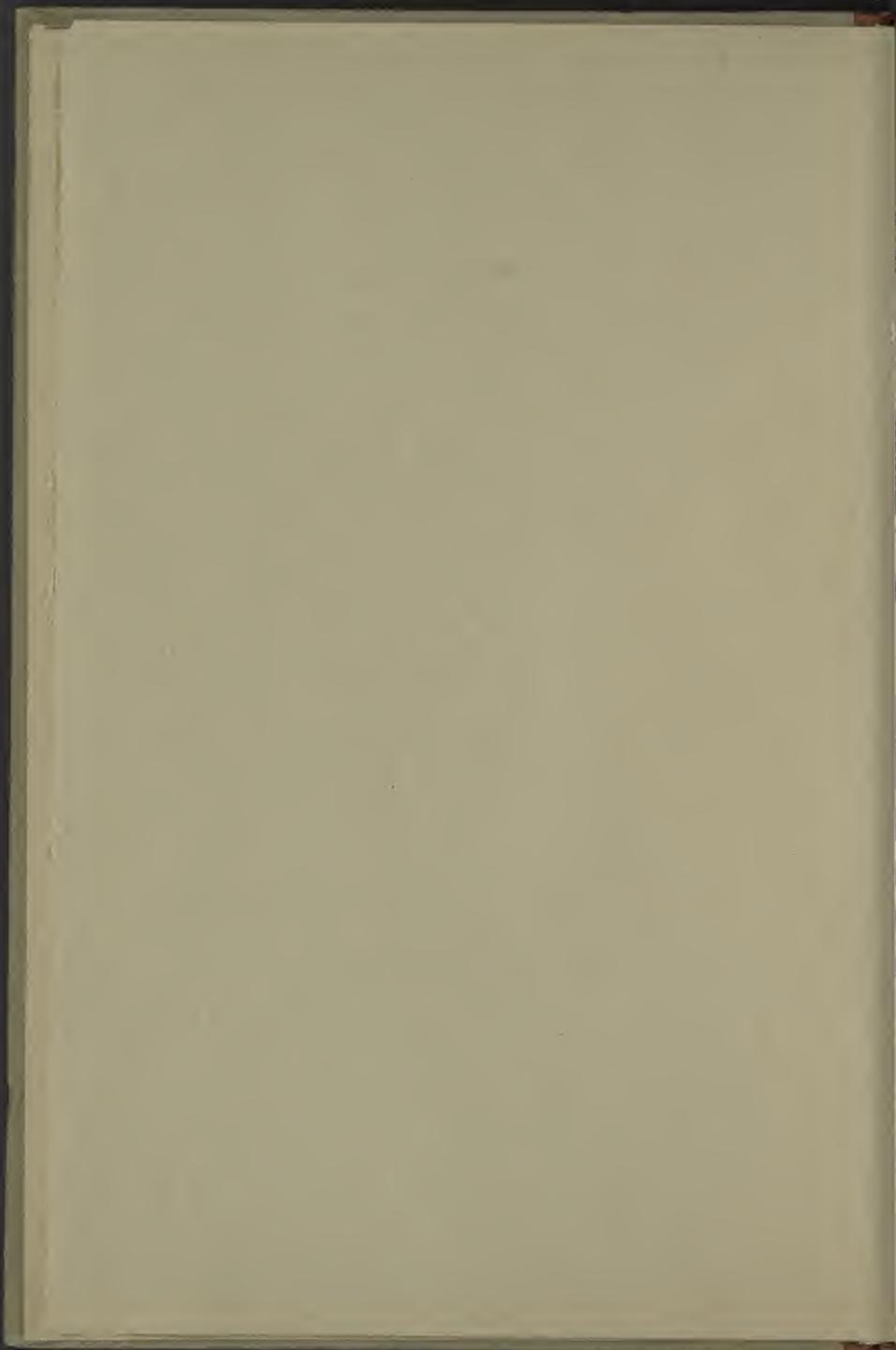
A GRAMMAR OF
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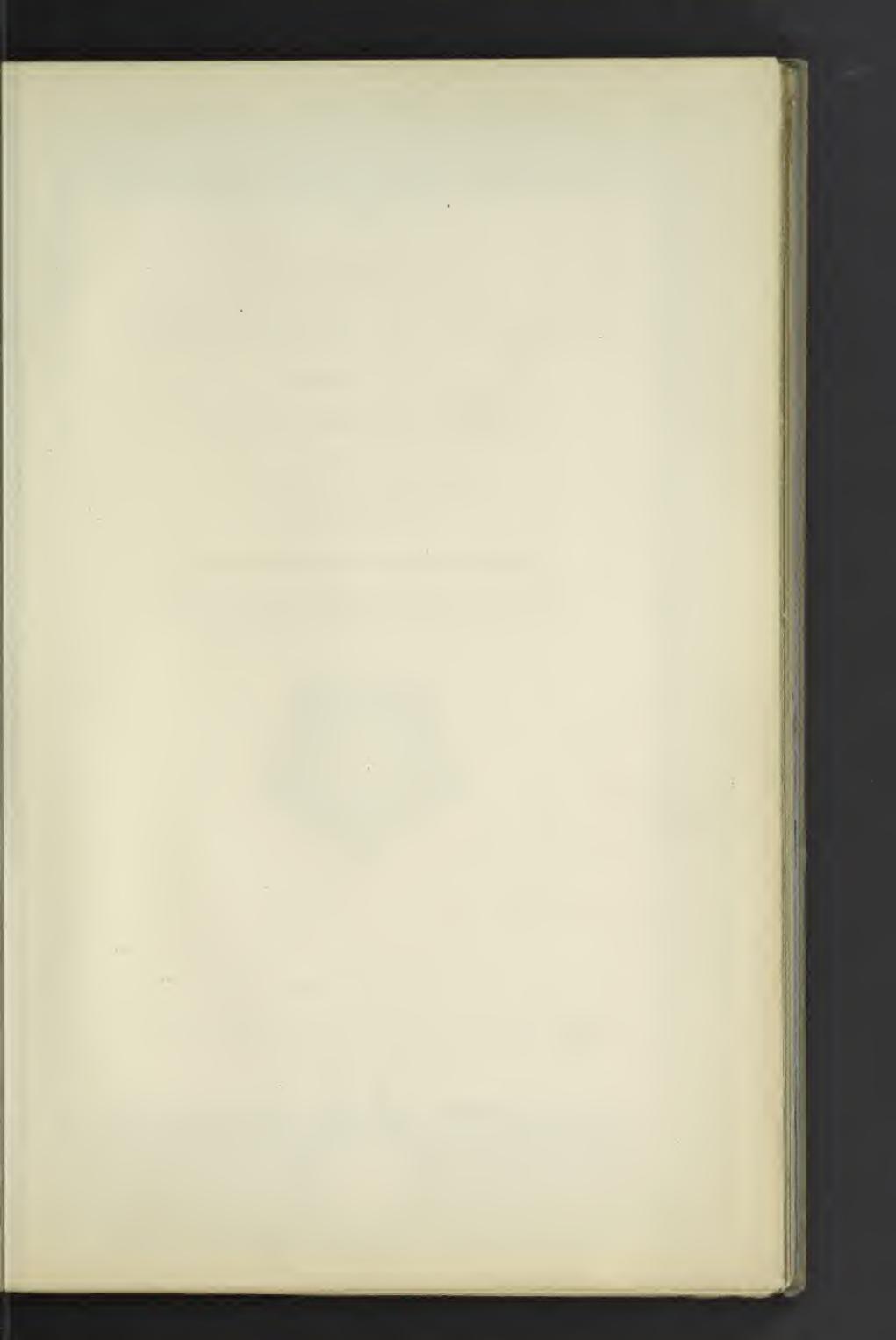
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A
GRAMMAR OF COLOR

ARRANGEMENTS OF
STRATHMORE PAPERS

IN A VARIETY OF PRINTED
COLOR COMBINATIONS
ACCORDING TO

THE MUNSELL COLOR SYSTEM

with an introduction by Professor A. H. MUNSELL and explanatory
text with diagrams illustrating the application of the System
to work in the Graphic Arts by T. M. CLELAND



1921

PUBLISHED BY

THE STRATHMORE PAPER COMPANY
MITTINEAGUE, MASS.



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STRATHMORE PAPER COMPANY

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Published March, 1921

A decorative horizontal banner with intricate floral and geometric patterns at its ends. The word "PREFACE" is centered in a bold, serif font within the banner.

LIKE any other work undertaken in a new field, this book has grown prodigiously since its first inception and the task and expense involved in producing it has mounted with its development at a rate which appeared, at times, to seriously threaten its completion. It is, therefore, with what we feel to be a justified sense of pride and satisfaction that this company is able to offer to printers, publishers, advertisers and all others who have occasion to use color a book which, though it calls attention to our own product in the field of paper making, may also add its quota to the sum of human knowledge and be of lasting usefulness to our many friends.

This book presents a system for the measurement of color and for its orderly use, and demonstrates this system upon a number of cover papers selected from the extensive Strathmore lines. The fact should be emphasized that neither the Munsell Color System nor this exposition of it is intended to present a creed or dogma for the use of color, nor to supplant the exercise of instinct and trained perception. It is intended as an aid to the training of a color perception and the quickening of an instinct for color, but failing even in this, a reasonably close adherence to the principles which it puts forth will certainly help to avoid the outrages upon color harmony which are committed in every-day practice.

It is regrettable to have to record here the death of Professor Munsell but a little time before the work of printing this book, the first to treat of the practical application of his theories to a great industry, was actually started on the press. He had manifested an earnest interest in its conception and would have taken keen enjoyment from surmounting the difficulties of producing it. Thus deprived of his wise counsel and his enthusiasm, all concerned in the making of this book have found their task the greater, though not the less worth while.

STRATHMORE PAPER COMPANY

This book was arranged and prepared with the authority of the late A. H. MUNSELL of Boston, who spent his life in the perfecting of the Munsell System of Color, and it is the first presentation of this system to the Printing, Advertising and Paper Trade.

The book was designed in its general form and the color sheets have been designed and patented by ARTHUR S. ALLEN of New York, who also selected and arranged all of the color combinations shown in it.

The decorations throughout the text, and the type composition of this book, were designed and executed by T. M. CLELAND of New York, who also executed the presswork on the color sheets.

The presswork of the text forms, title page, and the color plates by Helen Dryden, was executed by the REDFIELD-KENDRICK-ODELL Co. INC., New York,

The decorative designs on the color sheets and the areas showing color combinations were designed and executed by RUDOLPH RUZICKA of New York.

The inks used throughout are manufactured and sold by PHILIP RUXTON, INC., New York, Chicago and Boston. Any of these may be ordered by the Munsell System of Notation, thus: R₅/5 which means Hue, Red; Value, 5; Chroma, 5. These letters and numbers are shown at the right of each pair of color areas on the color sheets.

This book was produced by the Advertising Department of the Strathmore Paper Company, under the direction of C. W. DEARDEN.

The binding of this book was executed by the EUGENE C. LEWIS COMPANY, New York, under the personal supervision of RAYMOND E. BAYLIS.

AN INTRODUCTION TO THE MUNSELL COLOR SYSTEM

By A. H. MUNSELL

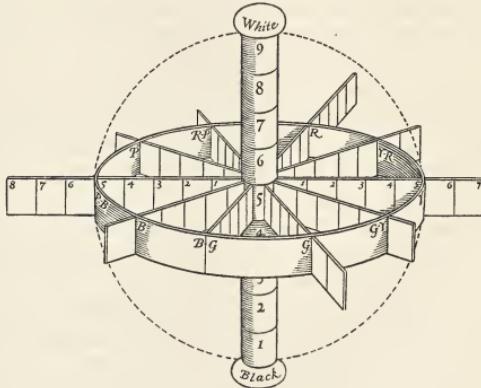


A CLEAR mental image of color relations must underlie any intelligent grouping of its hues in the best degrees of strength and light. This image is best produced by using a sphere to represent the world of color. With white at the North pole and black at the South pole; and its axis between these points a measured scale of grays, we have a decimal neutral scale which painters call Value. The middle point of this axis must be a middle gray and a plane passing through to the equator must contain colors of middle value. If therefore the equator be spread with a color circle of Red, Yellow, Green, Blue, Purple; and the half-way points by their mixtures in Yellow-Red, Green-Yellow, Blue-Green, Purple-Blue, Red-Purple, we have the equator as a decimal scale of hues merging gradually from one to the next and returning upon itself at Red. Each of these hues is supposed to grow lighter until it merges into the North pole at white, and darker similarly to black, and these are called the values (light) of color. They may also be imagined as passing inward until they disappear in the gray axis. Should there be still stronger colors they will continue upon the same radii outside the sphere. These we call the Chromas (strength) of color. In this way every point inside of the sphere and some upon the outside are arranged in three scales as follows: A vertical scale of light values, a horizontal scale of Chromas, and a circular scale of Hues; and since these are all in decimal divisions it becomes easy to make it a permanent mental image in which to see all color relations. Naturally every point in these three scales has its defined number, just as a solid object has its three dimensions; and to write them as a symbol of that color, thus doing away with the foolish misleading names which are prevalent, we have only to image the three angles of a triangle occupied with the three parts of that symbol—the left hand angle by the Hue initial (Red, Yellow-Red, etc.); the upper angle

by a number describing its value in the scale of light; and the right hand angle by a similar number describing its Chroma in the scale from the axis outward. Thus, Vermillion has for its symbol R 5/10.

This may seem revolutionary to the business man who has heard no end of fanciful names which fail to describe colors; but each symbol accurately describes the color in its dimensions of Hue, Value and Chroma.

This has all been worked out in permanent color in the "Atlas of the Munsell Color System" and each step bears its permanent symbol. There can be no new color discovered for which a place and symbol is not waiting. With this system in mind it is as easy to understand color relations as to understand musical relations on the written score. Indeed it furnishes the written score which is described in the hand book "A Color Notation." From this "Atlas"** the pairs of colors shown on each page of this book are mere suggestions to the color printer of combinations which harmonize with that particular cover paper. Always refer back to the "Atlas of the Munsell Color System"** where many other combinations are awaiting.



* "A Color Notation" and the "Atlas of the Munsell Color System" may be purchased at any bookstore.



BALANCE OF COLOR

THE sense of comfort is the outcome of balance, while marked unbalance immediately urges a corrective. That this approximate balance is desirable may be shown by reference to our behavior, as to temperatures, quality of smoothness and roughness, degrees of light and dark, proportion of work and rest. One special application of this quality is balance which underlies beautiful color. The use of strongest colors only fatigues the eyes, which is also true of the weakest colors. In a broad way we may say that color balances on middle gray. Thus a moderate amount of extremely strong color may be balanced by a right quantity of grayer color; and a brilliant point of strong red will balance a larger field of the grayest blue-green. Thus AREA is another quality in color composition, which aids in the balance of Hues, Values and Chromas. Examples of this are all about us. The circus wagon and poster, although they yell successfully for our momentary attention, soon become so painful to the vision that we turn from them. Other examples are magazine covers and the theatrical billboard. These are all cases where color is used only to excite the eye but not for its permanent pleasure. In the case of this book of cover papers, the problem is to so soothe and please the eye that the attention will remain upon them and the applied colors, thereby enhancing the appearance of the paper chosen. The large truth is that general color balances approximately upon middle gray. Although the colors may differ greatly, yet their total effect is balance.

Let us take a point upon the color sphere such as R_{5/5}. There are three distinct color paths for which this becomes the center. First a vertical path which extends from black through red to white; and in a decimal system is divided into ten equal steps. Equal departures either way from middle red must balance, such as R₇ with R₃, R₈ with R₂, R₆ with R₄, while the strength may be used so as to require equal or unequal areas of each balanced pair. The general law being, that the stronger the color we wish to employ, the smaller must be its area; while the larger the area, the grayer the

Chroma. Thus R₇/6 balances R₃/3 in the proportion of nine parts of the lighter red to forty-two parts of the darker red. In other words, these symbols will balance colors *inversely* as the product of their factors. This opens up a great field of *area* in the use of reds, where balance may be restored by changes in the factors of Value and Chroma. Thus the lighter red (R₇/6) which we will call 42 balances the darker red 3/6 which we will call 9, by giving 42 parts of the darker (weaker) red to 9 parts of the lighter (stronger) red.

A second path through Middle Red follows the equator of the sphere and again we may balance the Hues once or twice removed; as for instance, RP and YR or P and Y. These are called the neighbors of Red, popularly known as its shades. Instead of neighbors we may select the exact opposite of Red, Blue-Green, which is known as its complement, using equal areas if the colors are of equal strength or increasing the area of the weaker color. This second path does not depart from the level of the equator and therefore all the colors named are of a single Value without contrast of light and dark.

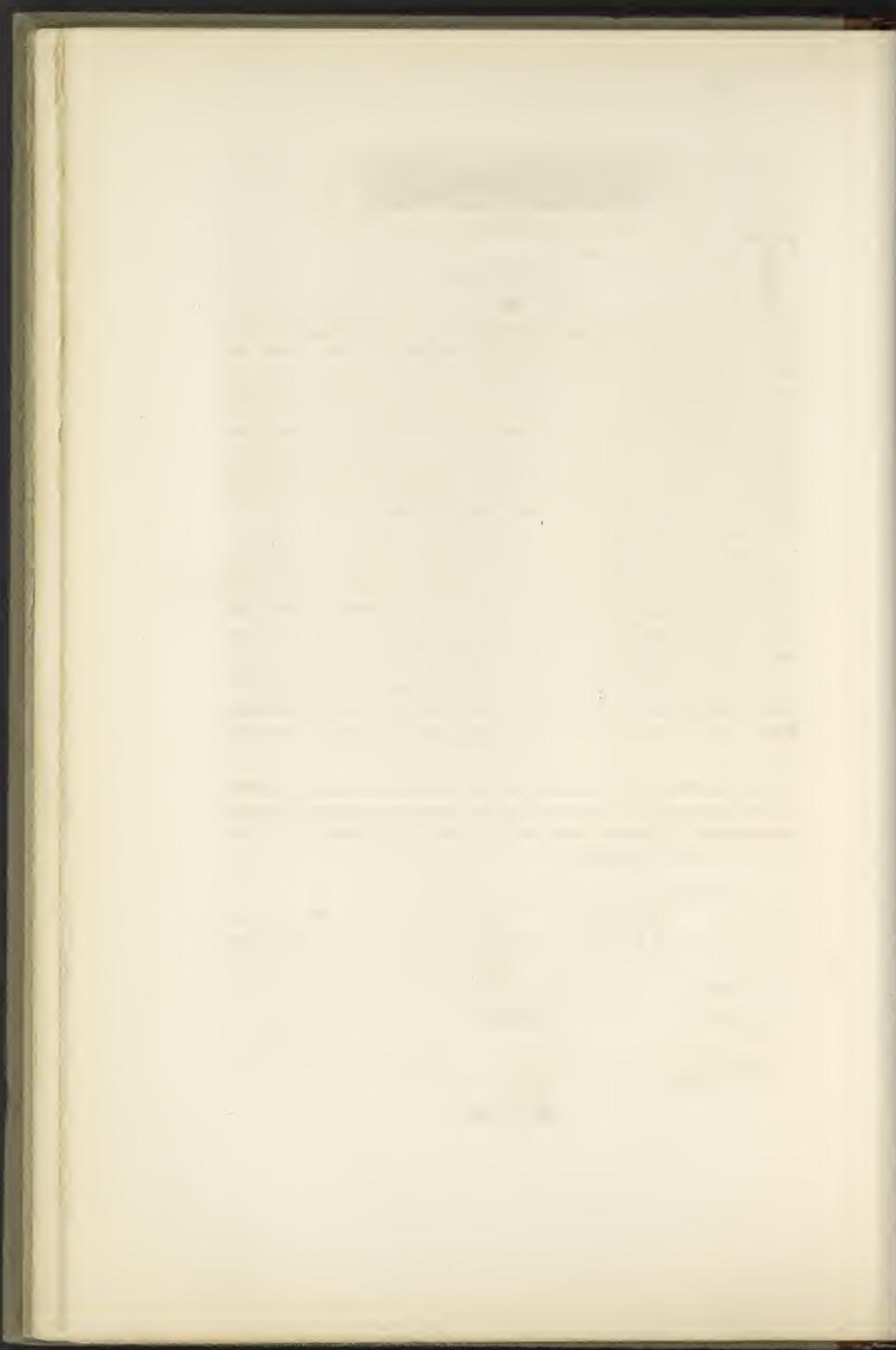
A more interesting path is the third, which may be passed through Middle Red, being neither vertical nor horizontal; but inclined so that if it passes upward out of Red toward lighter Purple it will pass downward from Red into darker Yellow.

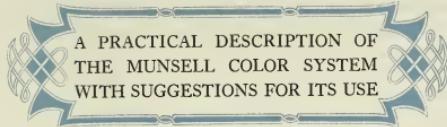
These three examples must suffice as a brief introduction to almost endless examples of color series and color intervals that are orderly and harmonious to the eye.



UNBALANCE OF COLOR

THAT any long duration of unbalance, either mental, physical or spiritual is an aggravated form of disease may be easily shown. Yet short periods of unbalance are very stimulating in the effort which they produce to regain balance. We see this in the introduction of discords in music. In contortions of the body. In intentional inversions of thought. This also shows in the seasoning of our food. Too sweet, too salt, too sour. It even shows in our criticism of pictures. We say, too light, too dark, too hot, too cold, too weak, too strong, and the effort of the accomplished artist is to overcome these forms of unbalance. The introduction of a color scheme of a certain moment of unbalance is called harsh color, it leads to its correction by what we call harmonious color (really balance); and the contrast enhances the latter; so that to overcome monotony, we should be able to use unbalance wisely at times, in order that the general balance may be the more evident. This is sometimes done in the picture gallery by means of a so called "gallery of horrors;"—in music by a sudden discord; in behavior by an unexpected rudeness;—all illustrations of the value of the contrast between harmony and discord; and this quality of contrast is proportioned to the use of color. If it is to serve as the background of the picture, the color must be quiet. If it is to be the makeup of the pictures themselves there must be strong oscillations in the contrasts of light and dark (Value), of hot and cold (Hue), of weak and strong (Chroma). As in the case of advertising color, especially in the open air, the very strongest contrasts and even strident relations are admissible. Any attempt in this sketch to encompass this broad question of color harmony would be impossible, and only the few suggestions are attempted to balance and unbalance, to contrast and to accent here mentioned, with their limited illustrations printed in the colors of the various cover papers.





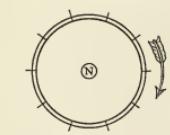
A PRACTICAL DESCRIPTION OF
THE MUNSELL COLOR SYSTEM
WITH SUGGESTIONS FOR ITS USE

By T. M. CLELAND

IN the introductory text, written especially for this book by Professor Munsell, will be found a brief compendium of his theories upon the dimensions of color and color relations, which though generally scientific in form, is stated with such admirable simplicity and absence of scientific verbiage that it merits the careful study of all practical workers, who would understand the basic idea upon which the matter of this book is built.* It has been thought wise, however, by the publishers to augment this with a practical description with illustrations of the cardinal principles of the Munsell System, more especially with a view to its actual use in printing and advertising, or in what has come to be generally known as the Graphic Arts. In so doing, there must necessarily occur a reiteration of much that appears in Professor Munsell's introduction, but its being expressed in different form, may tend to assist the practical reader toward a clearer comprehension.

The first essential to the application of the Munsell System is a clear understanding of the three dimensions of color, and once having grasped the simple logic of these, the practical advantages of the System will be manifest. The reader should be warned at the outset against that fear of scientific perplexity which is ever present in the lay mind. The three dimensions of color are not involved in the mysteries of higher mathematics. There is nothing about them which should not be as readily comprehended by the average reader as the three dimensions of a box, or any other form which can be felt or seen. We have been unaccustomed to regarding color with any sense of order and it is this fact, rather than any complexity inherent in the idea itself, which will be the source of whatever difficulty may be encountered by the reader, who faces this conception of color for the first time.

On the second of the three gray sheets which precede the other color sheets of this book will be found a colored diagram, accompanied by an explanation which has been made especially to present the three dimensions concretely and to avoid the abstractions of written explanation. The idea of the three dimensions of color can be even more simply, though less completely, expressed thus:



HUE
Measurement around a circle



VALUE
Measurement up a vertical pole



CHROMA
Measurement on a horizontal line away from a vertical pole

*It should also be borne in mind that this system does not deal with the pure science of color as wave lengths of light, but merely with color as manifested and commonly used in pigments.

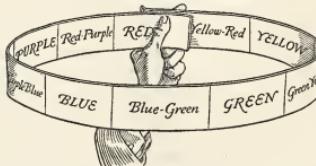
With these three simple directions of measurement well in mind, and by reference to the diagram mentioned above, where actual colors are printed, there need be little confusion for even the least scientific mind in comprehending what is meant by color "measurement." In considering further the qualities of color, which are expressed by these three dimensions known as Hue, Value and Chroma, we will take each one of them separately in the order in which they are written, trusting that having done so we may pass to the subject of color balance or harmony and its application to every-day practice, equipped with a clear understanding of how it may be measured and noted.

I. HUE

This first dimension is defined by Professor Munsell as "The quality by which we distinguish one color from another, as a red from a yellow, a green, a blue or a purple," but this dimension does not tell us whether the color is dark or light, or strong or weak. It merely refers to some point in the spectrum of all colors, such as we have seen in the reflection of sunlight through a prism. Let us suppose now that we had such a spectrum cast by a prism, or a section taken out of a rainbow. We know it to be a scientific fact that it contains all possible hues, merging by indistinguishable degrees, one into the other, but always in a fixed order. Now let us imagine that we have such a spectrum fixed or printed on a band of paper, and that it begins at one end with red and going through all possible hues, it arrives back at red again at the other end. The hues are unevenly divided and they merge one into the other by indistinguishable degrees. But still preserving the order of these hues, let us divide them into equal steps as we do a ruler into inches, by selecting certain colors familiar to us in every-day use—red, yellow, green, blue and purple. These we will call the Simple Hues, but between each of them we will make another division where each merges into the other. These we will call yellow-red, green-yellow, blue-green, purple-blue and red-purple and they will be known as Compound Hues, because each of them is compounded of two Simple Hues.*

<i>RED</i>	<i>Red-Purple</i>	<i>PURPLE</i>	<i>Purple-Blue</i>	<i>BLUE</i>	<i>Blue-Green</i>	<i>GREEN</i>	<i>Green-Yellow</i>	<i>YELLOW</i>	<i>Yellow-Red</i>	<i>RED</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>1</i>

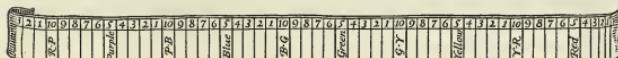
Thus we shall have 10 divisions upon our band. The reason for this number of divisions will be understood when we come to consider the question of Color Balance. It presents a sufficient variety of hues for purposes of demonstration, and for most practical uses. Now if we bend this band around into a circular hoop, so



*In the naming of these steps of Hue, Professor Munsell has wisely adopted a terminology which is commonly understood as referring only to color, and has avoided the use of such terms as orange, pink, violet, etc., which have other meanings and might lead to confusion. What is called *orange*, for example, he calls *yellow-red* because it is a mixture of these two hues.

that the red at one end meets and laps the red at the other end, we have a perfect scale of Hue in the circular form in which we shall always consider it. So it is that when we state the first dimension of a color we are merely referring to its position on this circle of hues. In writing a color formula this first dimension is expressed by the initial letter of the Hue—R for red, which is a Simple Hue, and B-G for blue-green, which is a Compound Hue.

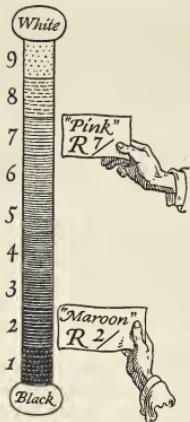
These 10 steps being a decimal number, may, of course, be infinitely subdivided and it may frequently happen, as it does in the color areas printed in this book, that a given color does not fall exactly on any one of these 10 divisions of Hue, but somewhere between two of them. Allowance has been made for this by dividing each of the steps of the Simple Hues into 10 further divisions. These 10 subdivisions represent about as fine a variation of Hue as even a trained eye can distinguish, and it would be obviously futile, for practical purposes, to carry it further. If we uncurl our band again, in order to better see what we are doing and note these divisions upon it, they will appear in this order:



Reading from right to left, beginning at the left of a Compound Hue, the numerals run from 1 to 10, 5 always marking a Simple Hue and 10 falling always on a Compound Hue. Thus we have a series of numerals denoting any practical step or gradation between one hue and another and in writing a color formula, of which one of these intermediary hues is a part, we place the numeral, denoting the position of the hue on this scale, before the letter which stands for the nearest Simple Hue, thus 7 R, 2 Y, etc. If, for example, we wish to write the formula of a color, the hue of which is neither Red nor Yellow-Red, but about half way between the two, we would write it 7 R or 8 R, according as it was nearer to the Red or to the Yellow-Red.

II. VALUE

This is the second dimension and is possibly the simplest to understand. It is, according to Professor Munsell's definition, "The quality by which we distinguish a light color from a dark one." We noted that the first dimension did not tell us whether a color was light or dark. It told us, for example, that it was red and not green, but we know that there may be light red and dark red, and it is the function of this dimension of Value to tell us how light or how dark a given color may be. For this purpose we shall need a scale of Value, which we may conceive as a vertical pole, or axis to our circle of Hues, black at the lower end, representing total absence of light, and white at the top, representing pure light, and between these a number of divisions of gray, regularly graded between black and white. This gradation could also be infinite. Since pure black is unattainable, we will call that 0 and begin our scale with the darkest gray as 1, numbering the steps up to 9, which is the lightest gray. Pure white, which is also unattainable, we will call 10. In the practical use of the scale of Value, therefore, we shall have but 9 steps and the middle one of these will be 5—what is referred to as Middle Value. This scale of

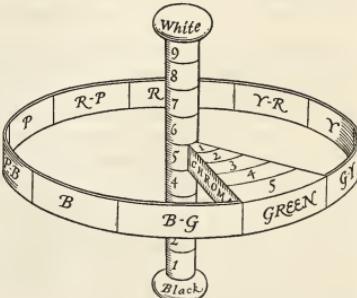


Value, or neutral pole, is well represented on the colored diagram already referred to, where it is shown with the actual gradations printed. These steps of Value have been scientifically measured and registered by means of an instrument known as a Photometer.* In writing a color formula we express this dimension of Value by a numeral, which denotes at what step upon the scale of Value this color falls. This numeral is written above a line, as B6/ for example, by which we mean that this particular blue, regardless of its other qualities is as light or as dark as the 6th step upon the scale of Value. A color such as is commonly called "maroon" is an example of a red which is *low in Value*, because it is dark, and what is called "pink" is a red which is *high in Value* because it is light.

Now having familiarized ourselves with these two dimensions, and understanding what qualities of a color they express, we may proceed to consider the third dimension, without which our description of any given color is incomplete.

III. CHROMA

When we have stated that the color is blue or yellow or green and that it is dark or light, we have indicated two of its important qualities—its Hue and its Value, but we have by no means described it completely. We may say of an emerald that it is green and that it is light, but we can say that certain grapes are green and also light, and yet there is a decided difference between their respective colors, if we place them side by side. Both may be green and of the same Value of light, but the emerald is *strong* in color and the grape is *weak* in color or *grayer*. It is this difference which is measured on the dimension of Chroma. The scale of Value has been referred to in the convenient and easily understood form of a vertical pole, which represents a neutral axis to all the circle of hues and is, itself, of no color, but is pure gray. Around this pole we may place our band representing the scale of Hue and then if we imagine any one of these hues on the circumference of the band to grow inward toward the gray pole in the center, growing grayer or weaker in color strength until it reaches this center pole and loses its color entirely, we have grasped



*The Munsell Photometer and the readings of Value made with it have been accepted as scientifically correct. This instrument is described in Professor Munsell's book "A Color Notation."

the idea of the dimension known as Chroma. By dividing this into regular measured steps, we have a scale upon which the strength of color may be measured. This is clearly illustrated on the colored diagram already referred to, where several steps of Yellow are shown printed on the scale of Chroma. This dimension of Chroma is written in a color formula by means of a numeral *below* a line, which denotes the step upon the Chroma scale at which it falls, thus /5, /8, /9, etc.

Needless to say, all of the hues may be thus measured on this dimension at right angles to the vertical pole and grading from gray, step by step away from the pole to greater and greater strength of color.

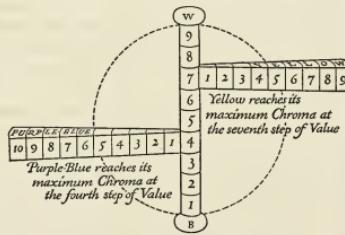
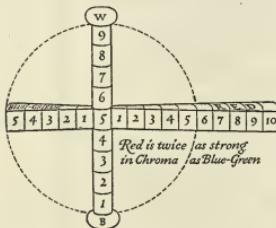
Professor Munsell has devoted a part of his introduction to a description of what he calls "The Color Sphere." This is a general form which aids the orderly consideration of color and within which all color balances, as will be shown later; but in the actual measurement of pigment colors, such as we use in printing or painting, all of the paths of Chroma would not be of the same length nor would they all be comprised within a sphere. Certain of them would extend to points outside of it. Nor would all of the paths of Chroma reach their greatest length at the equator of the sphere, that is the level of Middle Value. There are two reasons governing

this which it is important to understand: first, *Colors differ by nature in their Chroma Strength, some being much more powerful than others.* The strongest red pigment used, for example, is twice as powerful as the strongest blue-green pigment and will require a correspondingly greater number of steps on a longer path to reach gray. The Chroma path of Red is the longest and extends far outside the sphere, being ten measured steps from the neutral pole;* while Blue-Green is the shortest, being

only five steps. The sphere is limited in size to this shortest axis for reasons which will appear when we take up the question of Balance or harmony of color. The second reason is: *That all colors do not reach their maximum Chroma Strength at the same level of Value.* It can be readily comprehended, for example, that the strongest yellow pigment is by nature much lighter, or higher in Value, than the strongest blue pigment and, therefore, that the complete Chroma paths of these two colors will each touch the neutral pole at different levels.

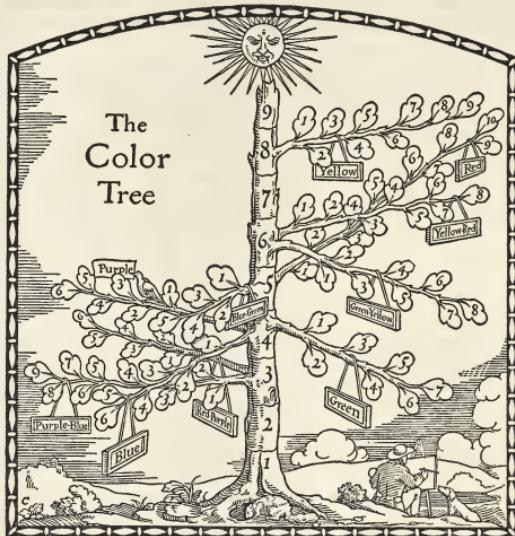
Thus it is evident that a complete image of all pigment colors cannot be comprised within the sphere; and we are led to seek another form which will convey

Red is twice as strong in Chroma as Blue-Green



* This is the Chroma of vermilion in dry form. Red printing inks are now made which are considerably stronger than ten steps of Chroma.

more completely the character of color qualities and dimensions governing the range of pigments in regular use. Professor Munsell has conceived this as a "Color Tree" with a vertical trunk for the scale of Value and branches representing the different Hues, these branches varying in length with the Chroma Strength of each Hue. In the appended illustration the leaves of the tree represent the measured steps of Chroma upon each branch.

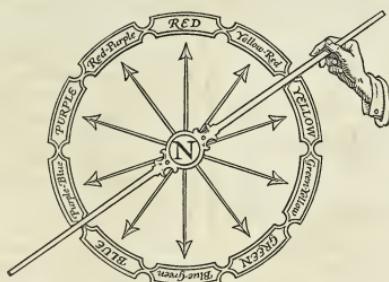


Upon the scale of Chroma the number of steps is limited only by the strength of pigments. The strongest yellow pigment in dry form, for example, will reach nine steps away from the neutral pole; but certain dyes on silk, or even printing inks and some unreliable pigments, may go one or more steps beyond this. As new and more powerful pigments may be discovered, they will add further steps to the scale of Chroma.

We have described each of the three dimensions by which any color may be measured, and noted how each is written in a color formula. It remains only to put these separate notations together and to write a complete color formula embodying all three dimensions. For example, we are given a certain color to measure and define and we find that upon the scale of Hue it is Purple-Blue. Upon comparing it with the scale of Value, we find it is but three steps from the bottom, and that it is only two steps away from the neutral gray pole upon the scale of Chroma. A complete formula for this color would, therefore, be written P-B $\frac{3}{2}$. It is scarcely necessary to point out the practical advantages of such a system of definite measure-

ment and notation over the vague and variable terms in general use, borrowed from the vegetable and animal kingdoms, such as plum, olive, fawn, mouse, etc., of which no two persons ever have quite the same idea.

It is hoped that the foregoing explanation of the three dimensions of color will have been sufficiently clear to convey to the reader a distinct mental image of what is meant by the terms, Hue, Value and Chroma, in order that we may proceed to the study of certain principles of order for the intelligent and harmonious use of color, which grow out of this simple and logical system of measurement



OPPOSITE OR COMPLEMENTARY COLORS

The above diagram, displaying a circle of the ten regular Hues arranged in the immutable order imposed by the spectrum, and reading clockwise, beginning with Red at the top, will serve, with but little explanation, to illustrate what is meant by "opposite," or the possibly more familiar word "complementary," colors. The term opposite is used preferably in the Munsell System because it is simple and is self-explanatory, as will be seen by reference to the above diagram, where each Hue on the circle will be found directly opposite to another Hue. Thus a straight line drawn from Red on the circle of Hues through the neutral pole will pass through Blue-Green, its opposite or complementary color. A line from Blue through the neutral pole will pass through Yellow-Red and so on throughout the whole circle. It should be noted that each of the simple Hues, Red, Purple, Blue, Green and Yellow falls opposite a compound Hue, Blue-Green, Green-Yellow, Yellow-Red, etc. Now two colors which are thus opposite to one another are not only farthest apart upon the diagram, but are in actual use the most strongly contrasting. It does not matter at what point we draw the line, whether it is from one of the regular Hues or from a point between two Hues, if it passes through the center it will fall upon the Hue or intermediary Hue which is its strongest contrast. This may be more readily visualized if we imagine the spindle indicated on the diagram as pivoted on the neutral pole and movable to any point on the circle. The question may be asked as to how it is determined that these colors, which fall opposite to one another on the scale of Hue, are, in fact, the most strongly contrasting colors. The answer to this question will serve to demonstrate the logical foundation of the Munsell System. When any

two colors are truly opposite or at the point of strongest contrast, their admixture will produce a perfectly neutral gray. Though this may be accepted as axiomatic, it can be easily proven with scientific accuracy by arranging two opposite colors on a disc in proportions relative to the Chroma strength of each and revolving them with such rapidity that we cannot see them separately and they are mixed, when if they are truly opposite, they will unite in a perfect gray.* Therefore working back from this fact, the scale of Hue has been so composed that those colors which thus mixed with each other do actually make gray, are placed directly opposite on a line running through the neutral gray pole. Another question which may arise is

what will take place if we draw a straight line between two Hues which are not opposites; and what would be the result of the admixture of these. This can best be answered by the accompanying diagram, where three different lines have been drawn, no one of them through the neutral center. These lines, it will at once be seen, cross points which are not neutral, but nearer to one or another of the Hues lying between the ones from which the lines are drawn; and the result of the admixture obtained is noted on the diagram.

This will be sufficient to further demon-

strate the simplicity and logic of the System and to suggest to the reader other interesting examples of it.

BALANCE

In describing the dimension known as Chroma, we noted the fact that certain of the Hues were much more powerful than others, in this regard, and were only to be represented by lines or paths extending beyond the others and outside of the sphere. We found that Red, for example, on any step of Value is more powerful and requires a longer path than its opposite, Blue-Green; and that Yellow is longer than its opposite, Purple-Blue, on the high steps of Value, but shorter on the lower steps of Value. This brings us naturally to the question of Balance of Color, the vital question in all applications of color to practice. Now if we mixed equal parts of Red at its maximum Chroma with its opposite, Blue-Green, at its maximum, we would not get a perfectly neutral gray, but one in which the Red predominated very decidedly. It would be somewhat like a tug-of-war in which



*The same experiment may be tried with the actual admixture of pigments; but in this case the result is dependent upon the nature of the pigment, itself, that is upon properties other than those of its color, and is, therefore, not scientifically accurate.

there were ten men, each representing a step of Chroma, on one side and only five on the other. The resulting color would be pulled well over on to the Red side, because of the fact already stated that Red at its maximum Chroma is so much stronger than Blue-Green at its maximum Chroma. If, however, instead of taking equal amounts of the two colors, that is to say equal quantities of pigment or equal printed areas of each, we take what would correspond to an equal number of steps upon the scale of Chroma, we find that they do balance and produce a perfectly neutral gray, in which neither the one Hue nor the other predominates. Let us glance for a moment at these two diagrams, in which a bar represents the line of Red and Blue-Green, with five steps of Chroma for Blue-Green and ten steps of Chroma for Red, as is the case with these two Hues at Middle Value. The bar rests upon a

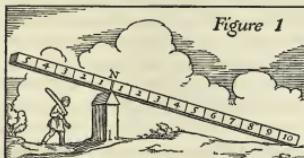


Figure 1

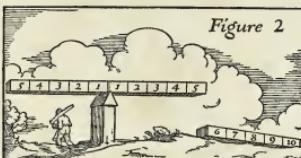


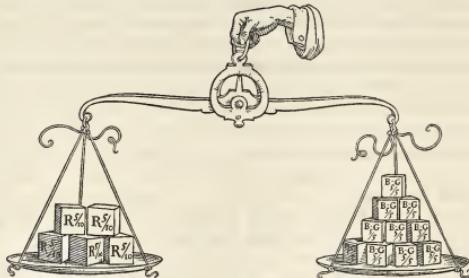
Figure 2

fulcrum at the neutral point and obviously it will not balance, but will fall to the Red side, as in Figure 1. But if we cut off steps 6, 7, 8, 9 and 10 from the Red side of the bar, it will balance upon the neutral gray, as in Figure 2. This will doubtless strike the reader as so simple and obvious that it scarcely merits statement; but it is just this simplicity which is characteristic of the Munsell System throughout, if approached from the same point of view. This, too, will explain why the diameter of our Color Sphere is limited to the shortest Chroma path at Middle Value. It will at once be apparent that within a sphere thus limited, all opposite colors will balance because being all of equal length at each level of Value no Chroma path can be longer than another or outbalance it.

Thus we see how two opposite colors may be balanced by employing only equal Chroma steps of each on the same level of Value, that R 5/5 will balance B-G 5/5 or G 5/3 will balance R-P 5/3 and so on throughout all of the Hues.* But in practice we may wish to employ a weak Chroma of one Hue with a strong Chroma of its opposite. In this case we cannot resort to the simple expedient of chopping off the excess strength of color on one end of the line, but must attain the desired Balance by another means. If our purpose is merely to make a perfect gray, we would use a greater amount of the weaker color; but if, as in general practice, we wish to produce a balanced or harmonious color design, we would employ a larger area of the weaker color than of the stronger. If we do this in correct proportions, relative to the strength of Chroma in each of the colors, we will attain Balance. We may prove that we have attained Balance by the fact that everything in our design, thus apportioned as to area and strength of Chroma, if mixed together, would produce a perfect gray. Let us suppose, for example, that we wish to employ in our design the maximum of Red and Blue-Green at Middle

*Examples of this will be found on the first three color sheets, where all of the Hues are shown thus simply balanced with their opposites, each sheet showing them at a different step of Value.

Value. Since we are speaking of Balance a pair of scales is an apt figure with which to illustrate the point. Into the pan on one side we will put *five* blocks of Red $5/10$, its maximum Chroma. In order to balance this we must put into the other pan *ten* blocks of the strongest Blue-Green, which is only $5/5$.

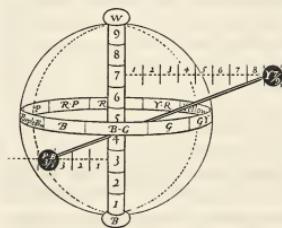


So we find that in order to balance two colors of unequal Chroma, but of the same Value, we use a larger area of the weaker Chroma with a lesser area of the stronger, and that the proportions are simply in inverse ratio to the strength of Chroma of each. That is, we use ten parts of Blue-Green at $5/5$ Chroma with five parts of Red at $1/10$ Chroma, or let us say six parts of Yellow-Red $3/4$ with four parts of Blue $3/6$, etc.

Thus far we have considered only Balance of opposite Hues on the same level of Value; but more often than not it will occur that we wish to print a design in colors which are not only different in Chroma strength but also on different levels of Value, and this difference of Value will also affect the question of Balance and of the amount of area which each color should occupy in order to attain it. Let us assume that we wish to print a design in Yellow of a high Value and strong Chroma, say Y $7/9$, with its opposite, Purple-Blue, a low value and weak Chroma, say P-B $3/4$. The path formed by a line drawn between these colors, passing through the neutral pole would not be horizontal in this case, since they are at different levels of Value, but would appear as in this diagram.

We now have to take the Value into account in determining the amount of area

of each of these two colors to be used if we are to arrive at a perfectly balanced color design; and this is done by the simple process of multiplying the Chroma by the Value of each of the colors. Multiplying the Chroma by the Value of Yellow $7/9$, $7 \times 9 = 63$, and doing the same with Purple-Blue $3/4$, $3 \times 4 = 12$, we get these two products 63 and 12. These are applied inversely, as in the former case, and we use 63 parts of Purple-Blue $3/4$ with 12 parts of Yellow $7/9$. The conclusion



is that the *stronger Chroma and higher Value should occupy the lesser area and the weaker Chroma and lower Value should occupy the greater area.*

All of the areas on the color sheets throughout this book have been measured and apportioned upon this principle with as great a degree of accuracy as possible, to better exemplify the rule; but it is not assumed that in printing a complicated color design the areas could all be measured and made to conform strictly to this law; or that the effect would necessarily be inharmonious if they did not. This is merely a guiding principle or ideal point at which we may aim in the actual printing of a color design. If we had such a design to print in two colors, for example, and one of the blocks from which we were to print it occupied what we would estimate by eye to be about twice as much surface or area as the other block, it would be simple matter to choose colors to conform. We might take Purple 4/6 for the larger area and Green-Yellow 6/8 for the smaller, or Blue 2/3 for the larger and Yellow-Red 3/4 for the smaller, or any other colors which would give us a proportion approximating that of the difference between the areas of our design. Circumstances will not always permit a strict adherence to the proportions indicated by this formula; but it will rarely, if ever, be impossible to follow the general principle of printing the larger area in the lower Value and weaker Chroma and the smaller area in the higher Value and stronger Chroma.

For purposes of illustration we have considered only designs in two colors; but it is scarcely necessary to say that the same rule would apply to three or any other number of colors. Reference to the prints of the design by Miss Helen Dryden, which appears at the end of this article with an analysis of their color Balance, will make this fact clear.

COLOR COMBINATIONS

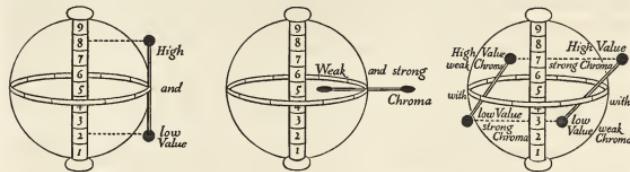
If in the foregoing we have touched upon the combining of colors in use, it has been only by way of explanation of some point in the laws of Measurement and Balance; and it is hoped that no impression has been created that the color combinations possible within the range of the Munsell System are limited to the examples which have thus far been mentioned. This is so far from being the case that any attempt to cover the subject of color combinations possible to this System would be quite futile within the limited scope of this article. A logical and orderly system will, in fact, offer a greater range of possibilities for the combination of color than could be discovered at random.

We must, therefore, be content to mention here only a few of the directions or paths which offer harmonious color combinations, trusting that the reader may be sufficiently interested by these to seek other possibilities of his own accord.

In considering the use of two colors together, we have repeatedly alluded to those having opposite Hues, because this appeared to be the clearest example with which to explain the idea of Balance. This combination of opposites is one of the simplest and surest of color harmonies. We have seen how, if properly proportioned as to amount or area, these opposite colors will balance in perfect neutrality; but another interesting fact with regard to them is that when placed together these contrasting colors tend to stimulate and enhance each other. This effect of contrast may be noted on the three gray sheets—the first of the color sheets, where the ten Hues are shown at three levels of Value, each printed with its opposite.

Though none of these colors is more than Middle Chroma, the effect is of their being much stronger. Other examples of opposite colors will be found on sheets 8, 9, 12, 16, 17 and 18.

Another very simple and practically infallible series of color harmonies may be made within a single Hue. Thus we may combine a low Value of any Hue with a high Value of the same; or, a weak Chroma of any Hue with a stronger Chroma of the same. A more interesting combination within a single Hue is that of a low Value and weak Chroma with a high Value and stronger Chroma or vice versa.

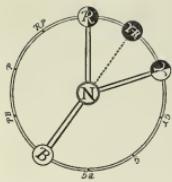


Experiments with the possibilities of single Hues will yield very interesting results in the great variety of colors thus obtainable. The areas printed on sheet 10, for example, are all derived from various steps of the single Hue, Yellow; and some of them will be a source of surprise to those who are accustomed to think of yellow within the limited field assigned to it by popular belief. Examples of other single Hue combinations will be found on sheets 6, 7 and 11.

Successful combinations can also be made between what are known as neighboring Hues, that is of any Hue with the Hue which immediately precedes or follows it on the scale—Green with Green-Yellow, Red with Yellow-Red, Yellow with Yellow-Red, etc. These may in turn be varied by taking them at different steps of Value and different strengths of Chroma. In the same way, Hues may be combined with neighboring intermediary Hues. In all of these cases the harmony depends upon proximity rather than contrast, as in the case of opposites. Examples of neighboring Hue combinations are to be found on sheets 4, 5, 6, 7, 13, 14 and 15.

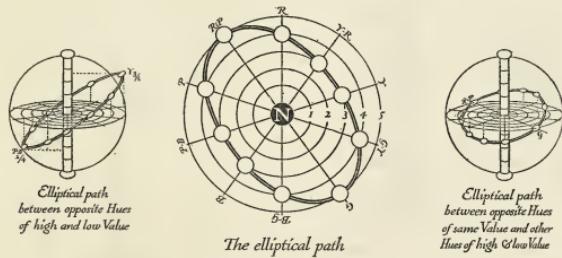
The use of three or more colors will present a problem at once more complex and more interesting and which, if approached in any regular order may assuredly be solved harmoniously. One method is to choose a certain restricted field of Hues such as Yellow to Red, for example, and then to select within this field regular steps of Hue, Value and Chroma which bear an orderly relation to each other. Examples of combinations thus planned will be found on sheets 4, 5, 6, 7, 13 and 15.

The principle governing the Balance of opposite colors will also apply to combinations of three colors. Let us assume that Blue is required as one of the colors in a three-color combination. We find that its opposite Hue is Yellow-Red, and as this is merely an admixture of Yellow and Red, it follows logically that the use of these two Hues, with due regard to proportion of areas or strength of Chroma, will yield a perfect color Balance. In order to determine the correct proportion of areas, or strength of Chroma of Red and Yellow which will bal-



ance harmoniously with our Blue, we may proceed exactly as in the case of a two-color combination of Blue and Yellow-Red; but in this case we would divide the amount or strength of a correct Yellow-Red between our Yellow and our Red. For example, let us take Blue $4/5$ and assume that we wish to combine it with a Yellow and a Red of higher Value and stronger Chroma, say $6/7$. Following the rule already stated, we multiply the Value of our Blue by its Chroma, that is 4×5 , which gives the product, 20 . Now taking its opposite Yellow-Red at $6/7$ and doing the same we get $6 \times 7 = 42$. If we were combining Blue $4/5$ with Yellow-Red $6/7$ we would use their products inversely, that is we would use 42 parts of Blue $4/5$ with 20 parts of Yellow-Red $6/7$. This gives us the amount of area for Yellow and for Red, because if we would use 20 parts of Yellow-Red, $6/7$, it naturally follows that we would use 10 parts of Red $6/7$ and 10 parts of Yellow $6/7$ to effect the same Balance.

We may note one more interesting point which will be of value in connection with the use of several colors, two of which are of opposite Hues. In studying the dimension Chroma we have seen that all of the Hues cross and meet in the neutral pole, which represents the point of their union. It follows naturally that the nearer our colors approach to this common center (the weaker they are in Chroma) the more nearly they are related; and the easier it becomes to harmonize them. Now two of our Hues being direct opposites will balance each other very well; but in the choice of other Hues between these we shall be in danger of discord as we leave their immediate proximity and arrive at points half-way between them, where we find neither the balance of proximity nor of contrast. We may avoid this danger in the selection of our colors between these opposites by choosing steps of Chroma for them which shall be nearer to the neutral pole and approach to within, let us say, three steps of it. The line thus traced between our opposite Hues will form an ellipse and colors taken anywhere on this line will safely accord. This may be more readily comprehended by a glance at this diagram.



This suggests variations in the application of the rule, such as are indicated in the smaller perspectives above, where the elliptical path is shown tilted to different levels of Value.

A further study of Color thus arranged in measurable order will assuredly be rewarded by the discovery of many interesting possibilities which we have failed to note here. The subject is endless and unless this article is to be likewise endless, the few suggestions which it offers must suffice. The deeper we penetrate this always fascinating subject, the more clearly we shall see that "color harmony" is only another term for color *order*; that order will yield order; and that any path in the Color Sphere, and some paths outside it, which are themselves orderly in form and interval, will lead through a series of colors which accord, and when used together will render the agreeable sensation which we seek in all color relations.

SUGGESTIONS FOR THE USE OF THIS BOOK

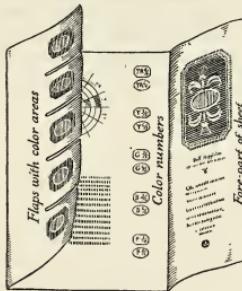
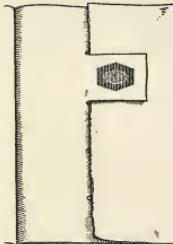
While some comprehension of the Munsell System of Color Measurement and Balance will, of course, make the color sheets of this book not only more intelligible, but more interesting, it is by no means essential to the usefulness of the book for those who have occasion to use or to select colors for printed matter.

The color sheets themselves present a considerable number of balanced combinations which are readily applicable to printing on these papers; and by experimenting with the extra sheets in the separate container, in accord with the instructions printed on them, the range is greatly increased. Also, the fact that nearly all the colors printed on any one sheet are so interrelated that they may be used in different combinations, than those shown, further multiplies the possible color combinations obtainable.

Each sheet is so arranged that any one of the pairs of color areas printed on it may be studied separately from the others. The slits divide each pair of areas into separate flaps, any one of which may be folded out over the fore-part of the sheet, as shown here.

By turning back the fore-part of the sheet, the color numbers will be revealed in positions opposite to each pair of areas. These color numbers or formulas are printed within a geometric form, corresponding to the forms of the areas to which they refer. These are the formulas of measurement according to the Munsell System, giving the three dimensions of each of the colors to which they refer.

The color of the paper of each sheet has been measured and the colors of the areas are related to it. On the inside of the sheet will be found a brief analysis of the series of colors used on that sheet. One of the pairs of colors has been selected in each case to print a decorative design, bearing the name of the paper, on the inside of the fore-part of the sheet. These two colors are also shown on a diagram in the positions they occupy on the scales of Hue and Chroma. Their positions on the scale of Value cannot be shown because the diagram is necessarily only two-dimensional.



A NOTE ON THE PRINTING OF THIS BOOK

It has been suggested that printers would be interested to know something of the manner in which this book was printed, inasmuch as it presents some unusual problems of presswork and handling.

The color sheets were printed one up, on a single Kelly press, in a small press-room entirely devoted to this job. The great number of impressions required on each sheet made speed and automatic feed almost imperative; and the constant changes of color called for an inking distribution system that was readily accessible to wash up. Five color areas were printed at one time by means of a closely divided fountain and split rollers. These areas, being printed across the shorter dimension of the sheet, made it necessary to run the sheet lengthwise instead of the way this size sheet would normally be run. The press was slightly altered by lengthening the feed and delivery boards and retiming the drop guides, and was set to double roll, because the sheet was actually longer than the printing circumference of the cylinder. Also the motion of the inking vibrator was somewhat curtailed because of the small space allowance between colors. In printing the inside of the sheet, no divided fountain could be used and the sheets were run in the normal way. Plates were beveled and mounted on patent blocks.

In nearly every case, a complete block of the areas and of the design on the inside of the sheet was run first with one impression of a white filler; and the different colors were printed over this. In a very few cases more than one impression of color was required.

The printing of the middle gray sheet, with the diagram in colors showing the three dimensions, was a special problem in itself which called for considerable care and patience. None of the colors or the different steps of gray was made by over printing, each one being a distinct impression over a white filler. Though some few of these colors were so placed that two of them could be printed at once by means of a divided fountain; it nevertheless required in all twenty-three impressions to complete this sheet, each of which called for fairly close register.

Fortunately, few printers are called upon to reproduce the actual pages of this book. Its color areas were required to match the Munsell measurements within the smallest possible margin of error and be so maintained throughout the edition. In work not intended, as is this, to present color standards for study and comparison, there would be little point in striving for such a degree of accuracy.



TWO PROOFS OF A DESIGN BY MISS HELEN DRYDEN for VOGUE
showing unbalanced and balanced color

PLATES ENGRAVED BY RUDOLPH RUZICKA



UNBALANCED COLOR

THE colors in this proof are poorly related and do not balance in neutral gray. In the first circle these colors are shown in approximately the same proportions of area that they occupy in the picture. If this circle were rapidly revolved, the resulting mixture would be as shown in the solid circle.

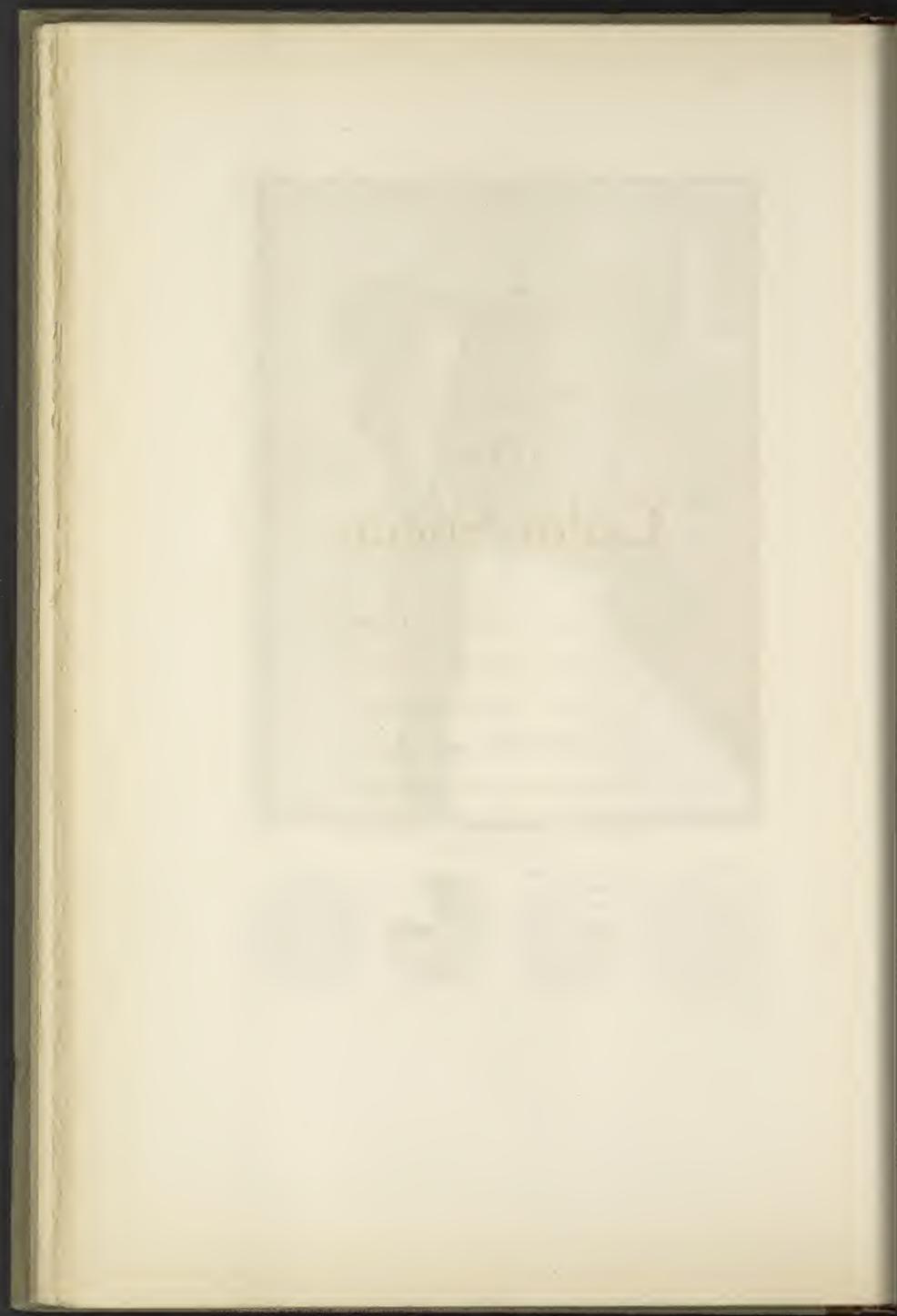


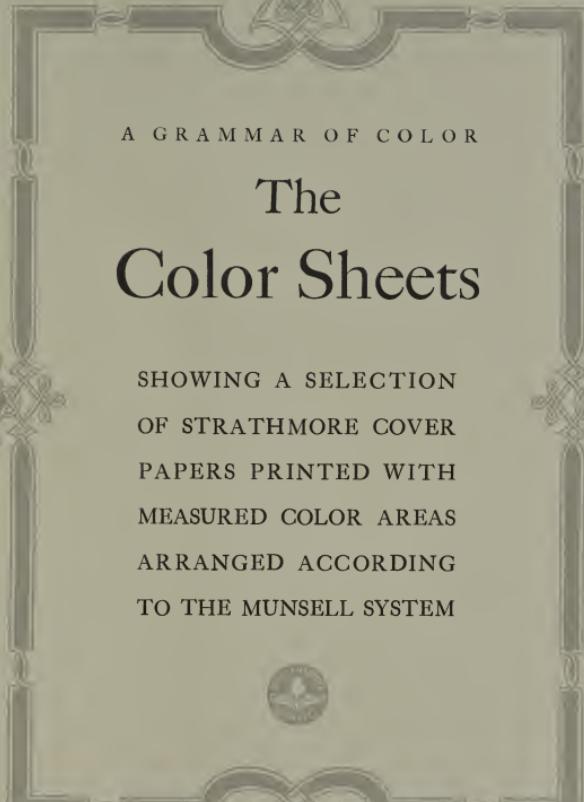


BALANCED COLOR

IN this proof, made from the same plates as the one on the opposite page, the colors are correctly related. The approximate proportion of area of each color to the whole is shown in the first circle. The neutral gray, which would result from an admixture of these colors in these same proportions, is shown in the solid circle.





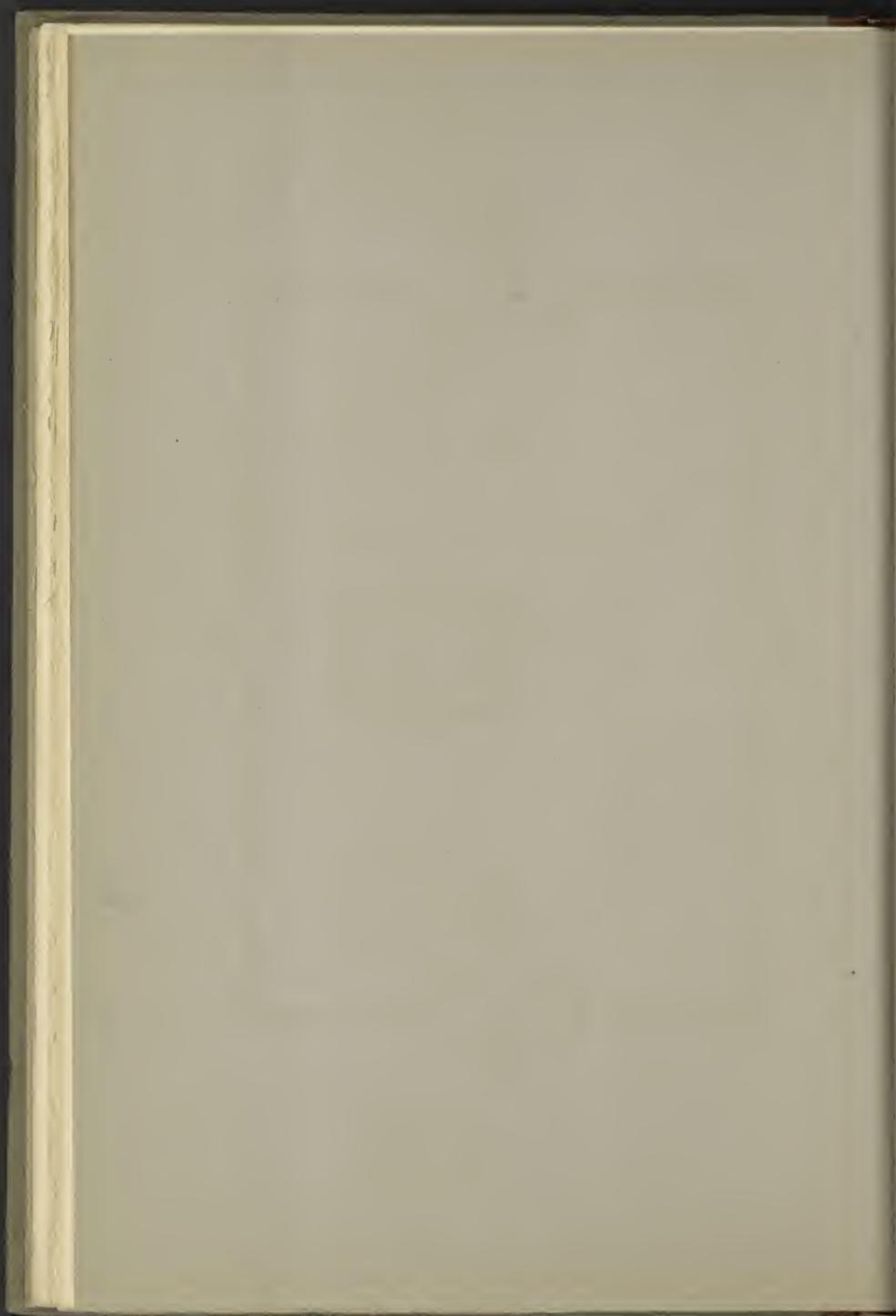


A GRAMMAR OF COLOR

The
Color Sheets

SHOWING A SELECTION
OF STRATHMORE COVER
PAPERS PRINTED WITH
MEASURED COLOR AREAS
ARRANGED ACCORDING
TO THE MUNSELL SYSTEM







R $\frac{7}{5}$

BG $\frac{7}{5}$



Y $\frac{7}{5}$

PB $\frac{7}{5}$



G $\frac{7}{5}$

RP $\frac{7}{5}$

the bottom of the page



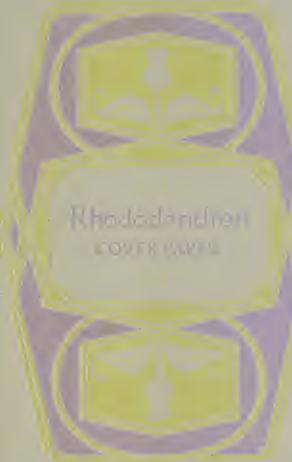
B $\frac{7}{5}$

YR $\frac{7}{5}$



P $\frac{7}{5}$

GY $\frac{7}{5}$



Frost Gray, Antique Finish
65 lbs., Substance No. 65



RHODODENDRON COVERS are manufactured as follows:

White and twelve colors.

$20\frac{1}{2} \times 26$, 35 lbs., Substance No. 35.

$20\frac{1}{2} \times 26$, 65 lbs., Substance No. 65.

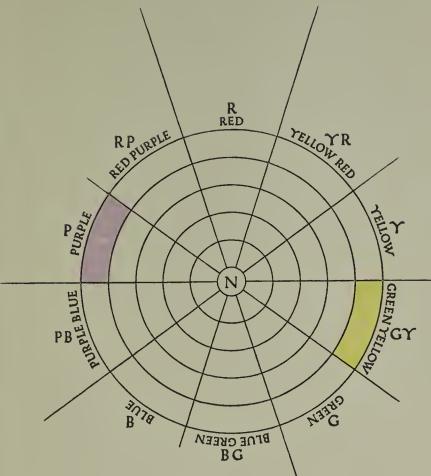
$20\frac{1}{2} \times 26$, Heavyweight, Substance No. 65 Pasted.

Antique and Telanian Finishes.

Dekle Edges and Grain long way of sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.





On the flaps of this sheet are printed the ten regular hues of the Munsell System. The outer areas are the five "straight" colors and the inner areas are the five compound colors. They are all high in the dimension of value, being seven steps from the bottom of the value scale. All are of medium chroma, five steps from the neutral pole or center on the scale of chroma.

The hues are so arranged that each outer area is the direct opposite or most strongly contrasting hue of its respective inner area. Thus balance or harmony is arrived at in each pair of colors by reason of direct opposition.

It is of interest to note that, due to this juxtaposition of directly contrasting hues, each of these colors attains the appearance of a brilliance or chromatic strength greater than it actually registers in the scale of chroma when considered alone.

The decorative design is printed in the colors of the bottom flap—P 7/5 and G-Y 7/5, the positions of which, in the scales of hue and chroma, are shown on the above diagram.

R 7/5

BG 7/5

Y 7/5

PB 7/5

G 7/5

RP 7/5

B 7/5

YR 7/5

P 7/5

GY 7/5



Frost Gray, Antique Finish
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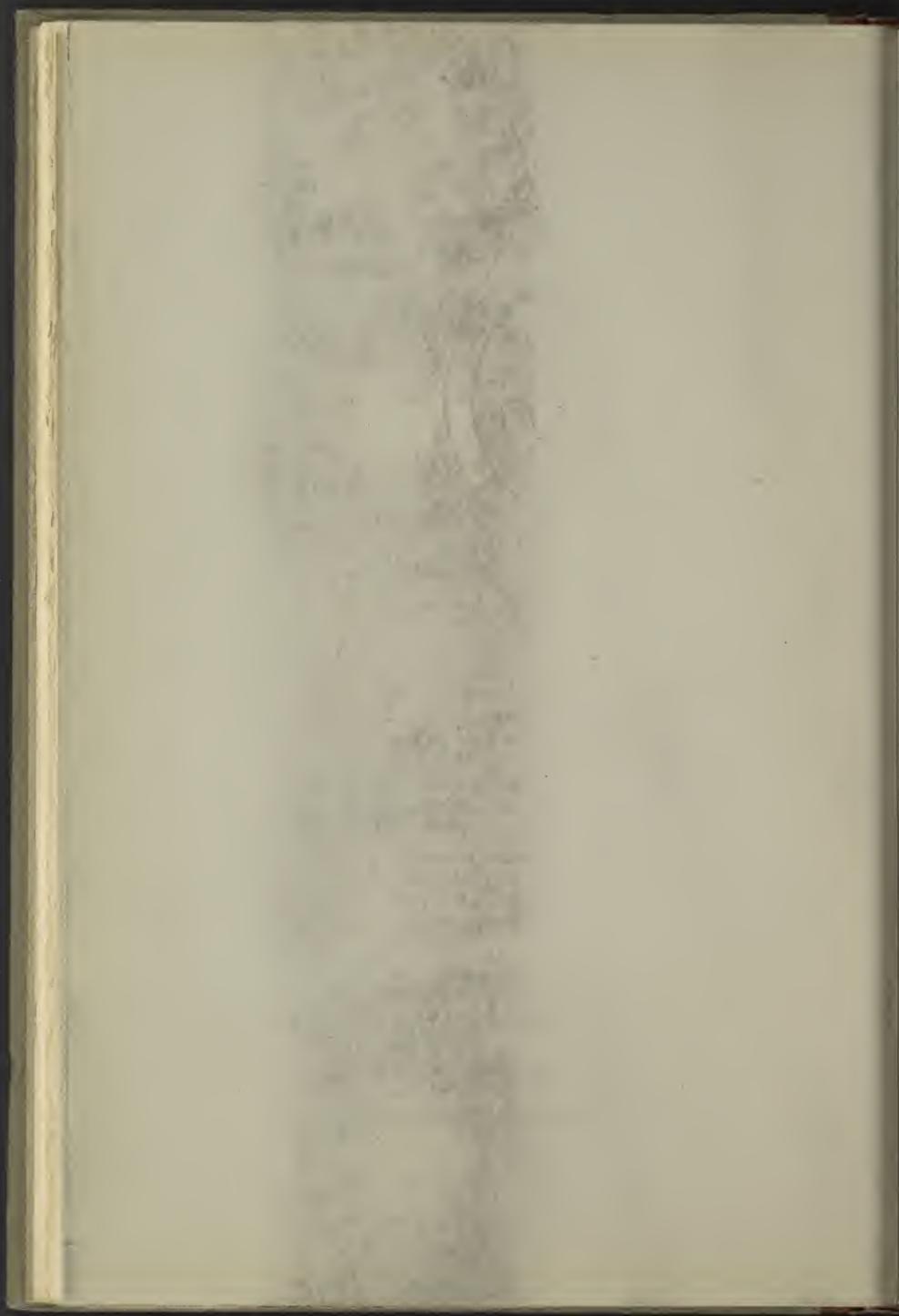
20½ x 26, Heavyweight, Substance No. 65 Pasted.

Antique and Telanian Finishes.

Deckle Edges and Grain long way of sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.





THE THREE DIMENSIONS
OF COLOR

ON the flaps are printed the ten regular HUES of the System, all at middle value and middle chroma, as expressed by the term $\frac{5}{5}$. The Hue of each outer area is the direct opposite or strongest contrasting Hue of its respective inner area.

The diagrams printed on this page are graphic illustrations of the three dimensions of color as employed by the Munsell System, intended to explain the terms HUE, VALUE and CHROMA used throughout this book.

The lower diagram, in the form of a wheel, shows the ten regular Hues arranged in a circle in the order of the spectrum, so that each Hue is opposite its true complement. This illustrates the dimension designated by the term HUE. This term refers to the position of any given color upon this circle. There are, for example, many kinds of red, but this dimension determines only the fact that it is red and not blue or green or yellow-red, without reference to any of its other qualities.

The second dimension to be considered is that known as VALUE and this is illustrated by the upper diagram drawn in perspective wherein a central pole or axis of the wheel is shown.

This pole is of no color, but is a series of regular steps of neutral gray beginning at the bottom with black and ending at the top with white. Each step is therefore a step from darkness to light. This is the scale of VALUES. In the present illustration the circle of hues is seen to be at the middle or fifth step of value, meaning that each of these hues shows midway between darkness and light. This complete circle of hues might be raised or lowered to any point upon this scale of values, making them all lighter or darker. Thus it will be seen that VALUE is the dimension which determines how light or dark any given color is, regardless of its other qualities.

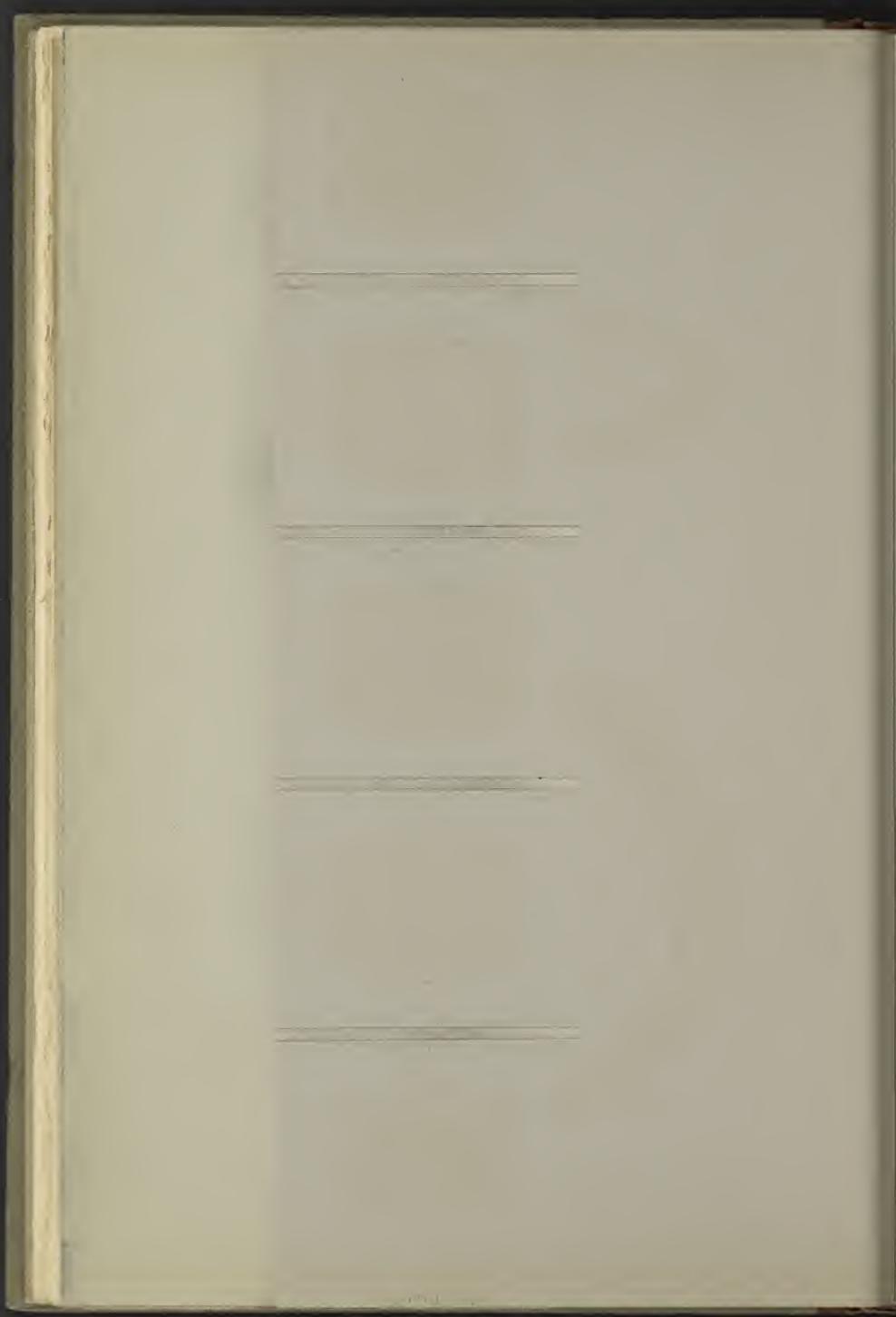
These two dimensions of HUE and VALUE however do not complete the description of a color any more than would two dimensions completely describe a solid form.

A third dimension is essential and this is known by the term CHROMA. It is illustrated on both diagrams by the yellow which is graduated in a series of equal steps beginning at the neutral pole and extending beyond the circumference of the circle. It will be noted that these steps beginning at gray become more and more yellow until they reach the maximum of color intensity attainable by yellow at middle value. (Pure yellow would be higher in value.) All of the other hues may be graduated in the same way. Thus the dimension CHROMA refers to the intensity of any color measuring from neutrality outward to whatever maximum it may attain at any given level of value.

The first dimension is HUE, written by the word RED, GREEN, BLUE-GREEN, etc., or by the initials as R, G, B-G, etc. The second dimension is VALUE expressed by a figure denoting the step upon the scale of values, written above a diagonal line thus— $\frac{2}{5}/\frac{3}{5}/\frac{4}{5}$, etc. The third dimension is CHROMA expressed by a similar figure denoting the number of steps away from the neutral pole and is written below the same diagonal line thus— $\frac{1}{5}/\frac{2}{5}/\frac{3}{5}/\frac{4}{5}$, etc. The complete notation of a color is therefore expressed as in this example—BLUE-GREEN or simply B-G $\frac{7}{4}$.

It should be understood that these diagrams show only the regular steps of the Munsell System for the purposes of illustration, but that in practice each of these steps in any dimension may be subdivided as far as the eye can distinguish the divisions and theoretically to infinity.





THE THREE DIMENSIONS OF COLOR

ON the flaps are printed the ten regular HUES of the System, all at middle value and middle chroma, as expressed by the term $5/5$. The Hue of each outer area is the direct opposite or strongest contrasting Hue of its respective inner area.

The diagrams printed on this page are graphic illustrations of the three dimensions of color as employed by the Munsell System, intended to explain the terms HUE, VALUE and CHROMA used throughout this book.

The lower diagram, in the form of a wheel, shows the ten regular Hues arranged in a circle in the order of the spectrum, so that each Hue is opposite its true complement. This illustrates the dimension designated by the term HUE. This term refers to the position of any given color upon this circle. There are, for example, many kinds of red, but this dimension determines only the fact that it is red and not blue or green or yellow-red, without reference to any of its other qualities.

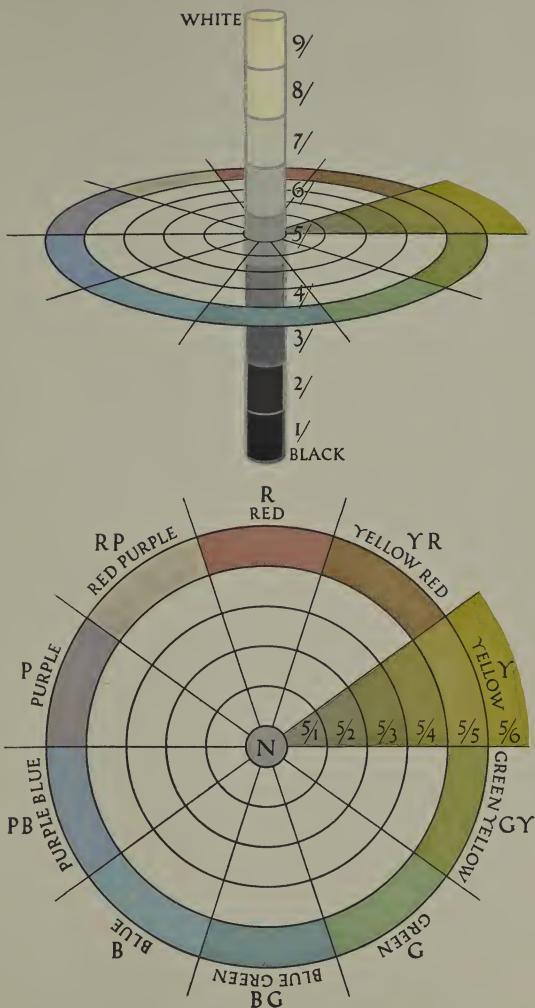
The second dimension to be considered is that known as VALUE and this is illustrated by the upper diagram drawn in perspective wherein a central pole or axis of the wheel is shown. This pole is of no color, but is a series of regular steps of neutral gray beginning at the bottom with black and ending at the top with white. Each step is therefore a step from darkness to light. This is the scale of VALUES. In the present illustration the circle of hues is seen to be at the middle or fifth step of value, meaning that each of these hues shown is midway between darkness and light. This complete circle of hues might be raised or lowered to any point upon this scale of values, making them all lighter or darker. Thus it will be seen that VALUE is the dimension which determines how light or dark any given color is, regardless of its other qualities.

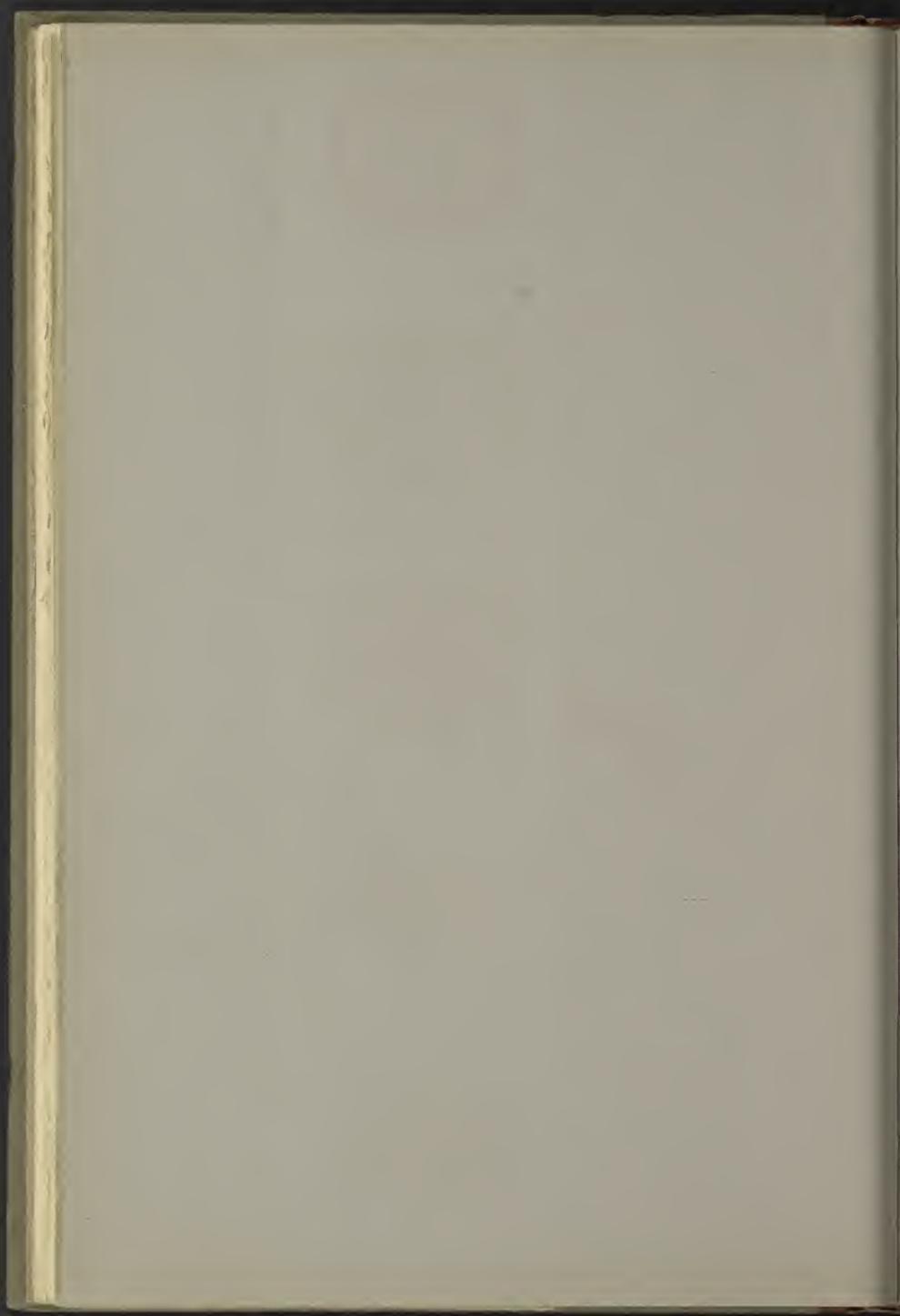
These two dimensions of HUE and VALUE however do not complete the description of a color any more than would two dimensions completely describe a solid form.

A third dimension is essential and this is known by the term CHROMA. It is illustrated on both diagrams by the yellow which is graduated in a series of equal steps beginning at the neutral pole and extending beyond the circumference of the circle. It will be noted that these steps beginning at gray become more and more yellow until they reach the maximum of color intensity attainable by yellow at middle value. (Pure yellow would be higher in value.) All of the other hues may be graduated in the same way. Thus the dimension CHROMA refers to the intensity of any color measuring from neutrality outward to whatever maximum it may attain at any given level of value.

The first dimension is HUE, written by the word RED, GREEN, BLUE-GREEN, etc., or by the initials as R, G, B-G, etc. The second dimension is VALUE expressed by a figure denoting the step upon the scale of values, written above a diagonal line thus— $2/3/4/$, etc. The third dimension is CHROMA expressed by a similar figure denoting the number of steps away from the neutral pole and is written below the same diagonal line thus— $/5/6/7/$, etc. The complete notation of a color is therefore expressed as in this example—BLUE-GREEN or simply B-G $7/4$.

It should be understood that these diagrams show only the regular steps of the Munsell System for the purposes of illustration, but that in practice each of these steps in any dimension may be subdivided as far as the eye can distinguish the divisions and theoretically to infinity.







R $\frac{3}{5}$

BG $\frac{3}{5}$



Y $\frac{3}{5}$

PB $\frac{3}{5}$



G $\frac{3}{5}$

RP $\frac{3}{5}$



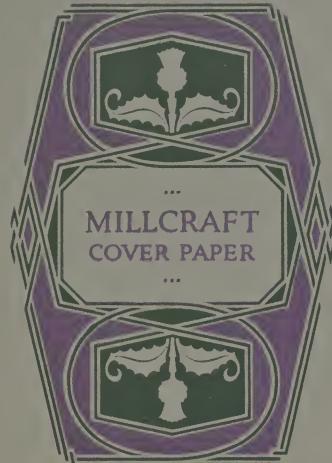
B $\frac{3}{5}$

YR $\frac{3}{5}$



P $\frac{3}{5}$

GY $\frac{3}{5}$



Gray, Antique Finish

26 x 40, 130 lbs., Substance No. 65



MILLCRAFT COVERS are manufactured as follows:

White and six colors.

26 x 40, 80 lbs., Substance No. 40.

26 x 40, 130 lbs., Substance No. 65.

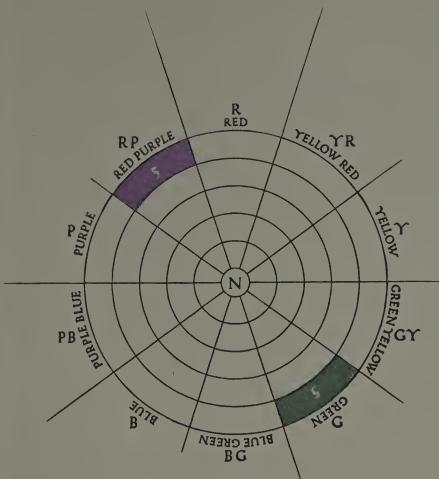
26 x 40, Heavyweight, Substance No. 65 Pasted.

Deckle Edges and Grain are 40-inch way of the sheet. 500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.







THIS sheet resembles the two foregoing sheets inasmuch as it shows the ten regular hues of the Munsell System printed on the flaps, except that on this sheet these hues are shown at a lower value, being only three steps from the bottom of the value scale.

These colors are likewise all of medium chroma, being five steps from the neutral pole on the scale of chroma.

The arrangement of the inner and outer areas is the same as upon the foregoing sheets so that each is shown with its opposite or most strongly contrasting hue, demonstrating the same law of balance.

The decorative design is here printed in the colors of the middle flap—G 3/5 and R-P 3/5 the positions of which in the scales of hue and chroma are shown upon the above diagram.

R 3/5

BG 3/5

Y 3/5

PB 3/5

G 3/5

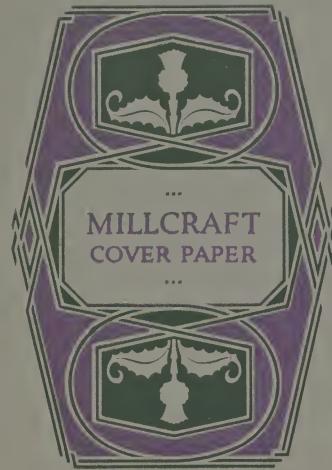
RP 3/5

B 3/5

YR 3/5

P 3/5

GY 3/5



Gray, Antique Finish

26 x 40, 130 lbs., Substance No. 65



MILLCRAFT COVERS are manufactured as follows:

White and six colors.

26 x 40, 80 lbs., Substance No. 40.

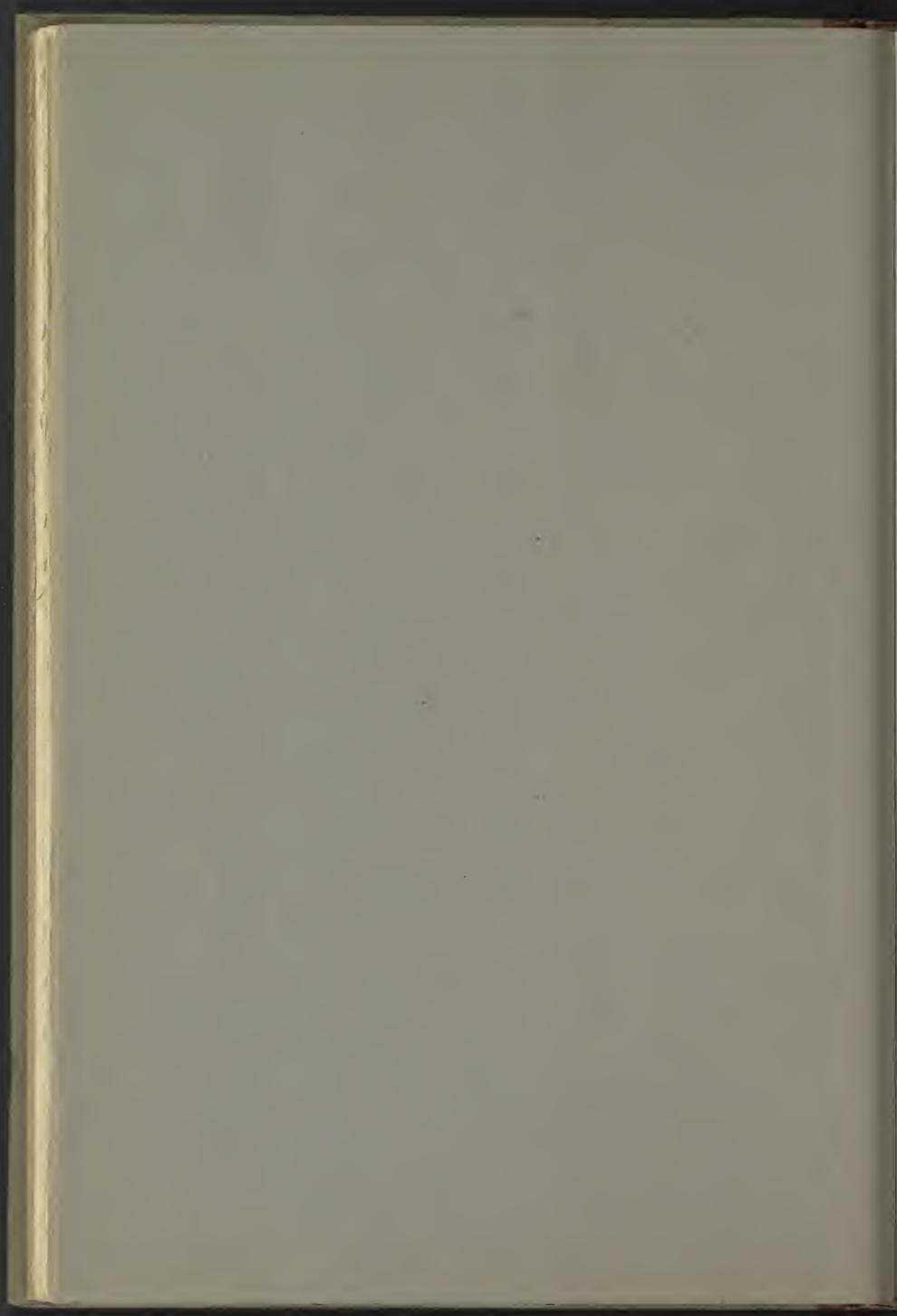
26 x 40, 130 lbs., Substance No. 65.

26 x 40, Heavyweight, Substance No. 65 Pasted.

Deckle Edges and Grain are 40-inch way of the sheet. 500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.





Shoe *

•
Rhindandian Cover

Fine
Fabric
Tanned





Y $\frac{7}{3}$

YR $\frac{2}{3}$



Y $\frac{6}{4}$

YR $\frac{3}{3}$



Y $\frac{5}{2}$

YR $\frac{5}{4}$



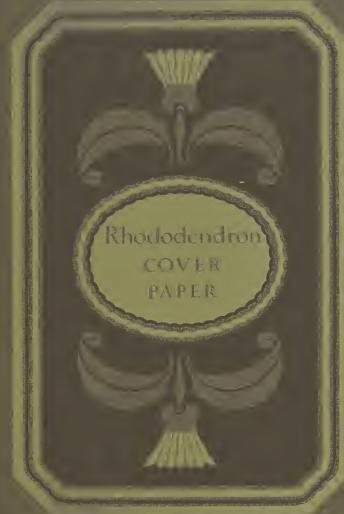
Y $\frac{3}{3}$

YR $\frac{6}{4}$



Y $\frac{2}{2}$

YR $\frac{7}{6}$



Pyro Brown, Telanian Finish
Mediumweight, Substance No. 65



RHODODENDRON COVERS are manufactured as follows:

White and eleven colors.

Mediumweight, $20\frac{1}{2} \times 26$; Substance No. 65.
Heavyweight, $20\frac{1}{2} \times 26$; Substance No. 65 Pasted.

Antique, Ripple and Telanian Finishes.

Deckle Edges and Grain long way of sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.





ALL of the colors printed on this sheet lie within the field of hues comprised by YELLOW and YELLOW-RED indicated on the above diagram.

The color of the paper itself measures approximately $3Y\frac{4}{2}$ and of the many colors possible to combine with it harmoniously, those shown on the flaps range, in the outer areas, from a high value and weak chroma of YELLOW at the top, to a low value of YELLOW at the bottom. The inner areas range from a low value of YELLOW-RED at the top, to a high value of an intermediary hue between YELLOW and YELLOW-RED at the bottom.

The decorative design is printed in the two colors of the second flap from the top, $Y\frac{6}{4}$ and $Y-R\frac{3}{3}$. $Y\frac{6}{4}$ being of much higher value than $Y-R\frac{3}{3}$ occupies proportionately less area. The positions of these colors in the scales of hue and chroma are shown on the diagram above.

$Y\frac{7}{3}$

$YR\frac{2}{3}$

$Y\frac{6}{4}$

$YR\frac{3}{3}$

$Y\frac{5}{2}$

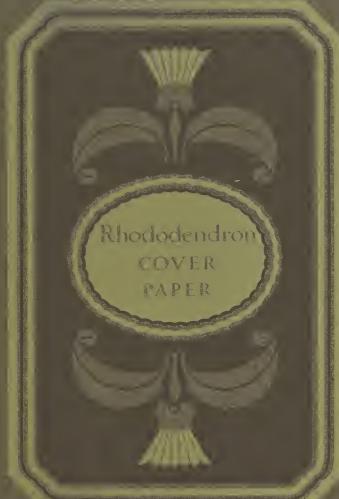
$3Y\frac{5}{4}$

$Y\frac{3}{3}$

$3Y\frac{6}{4}$

$Y\frac{2}{2}$

$3Y\frac{7}{6}$



Pyro Brown, Telanian Finish
Mediumweight, Substance No. 65



RHODODENDRON COVERS are manufactured as follows:

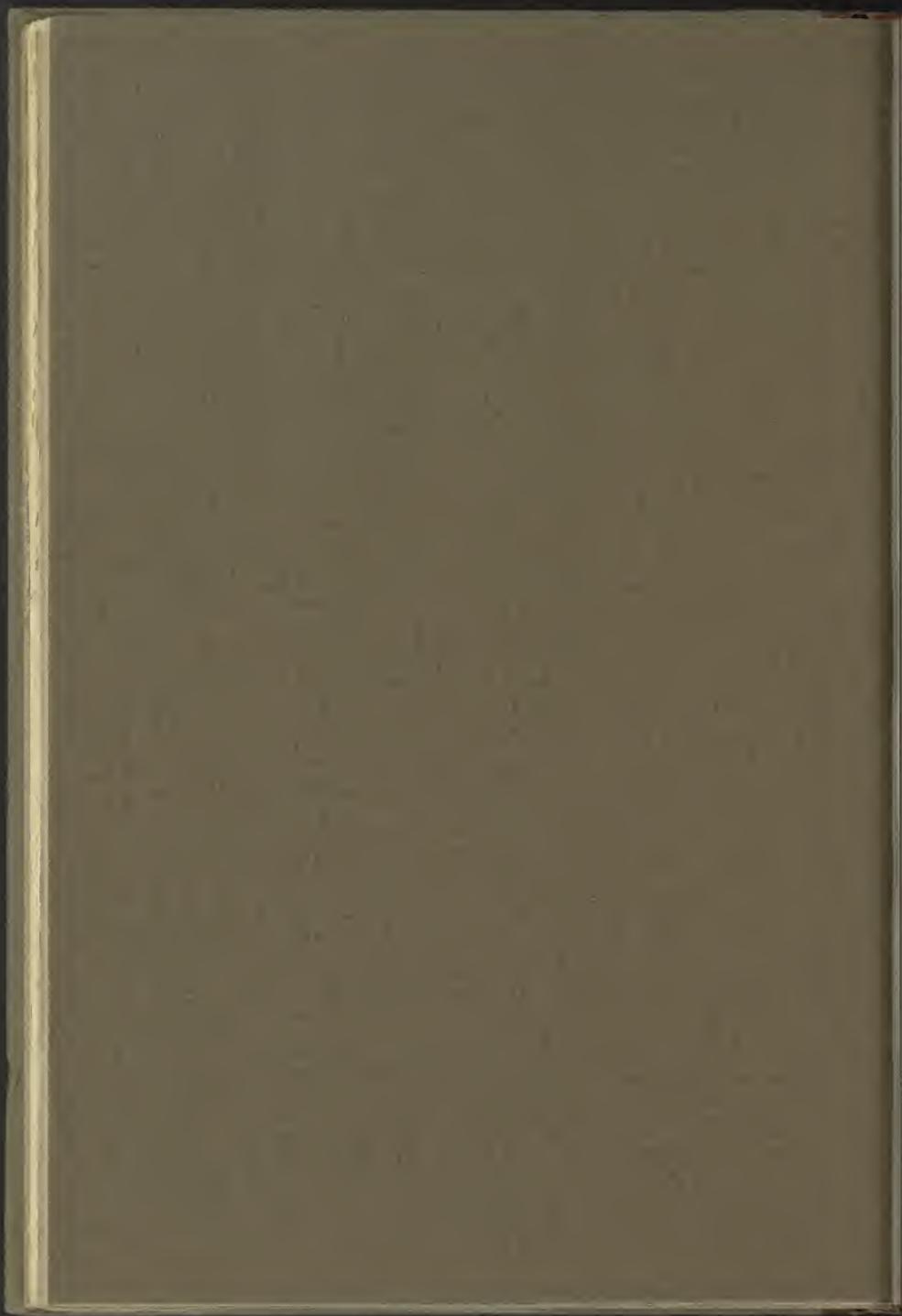
White and eleven colors.

Mediumweight, $20\frac{1}{2} \times 26$; Substance No. 65.
Heavyweight, $20\frac{1}{2} \times 26$; Substance No. 65 Pasted.

Antique, Ripple and Telanian Finishes.

Deckle Edges and Grain long way of sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.





Millcraft Cover

Brown

Antique Finish





2Y 9/5

7Y 5/5



2Y 5/5

7Y 4/4



2Y 3/6

GY 4/3



2Y 3/4

7Y 3/2



2Y 2/4

GY 2/3



Brown, Antique Finish

26 x 40, 130 lbs., Substance No. 65



MILLCRAFT COVERS are manufactured as follows:

White and six colors.

26 x 40, 80 lbs., Substance No. 40.

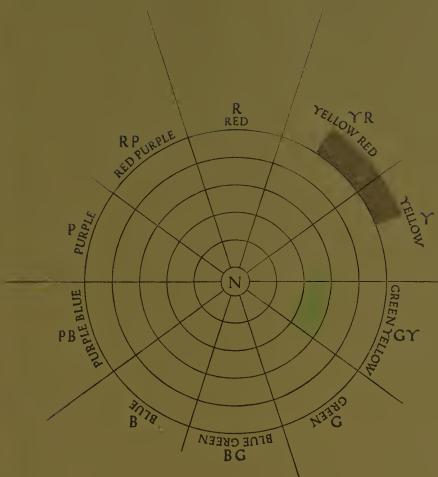
26 x 40, 130 lbs., Substance No. 65.

26 x 40, Heavyweight, Substance No. 65 Pasted.

Deckle Edges and Grain are 40 inch way of the sheet. 500 sheets to a ream.

Special Finishes can be supplied in
5 ream lots of a color.





THE colors printed on this sheet, as well as the color of the paper itself, all lie within the YELLOW-RED to GREEN-YELLOW field of hues.

On the flaps, the colors of the outer areas are all of the hue— 2 Y YELLOW: that is a hue which is two intermediary steps away from YELLOW-RED in the direction of YELLOW. They range from a high value at the top, to a low value at the bottom, and vary in chroma. In the inner areas the colors vary in hue, those of the bottom and the middle flaps being GREEN-YELLOW, and those of the other flaps being 7 Y YELLOW—an intermediary hue which lies between YELLOW and GREEN-YELLOW. They also range from a high value at the top to a low value at the bottom.

The decorative design is printed in the colors of the middle flap, the positions of which, in the scales of hue and chroma, are shown on the diagram above.

$2\text{ Y } 6/5$

$7\text{ Y } 5/5$

$2\text{ Y } 5/5$

$7\text{ Y } 4/4$

$2\text{ Y } 3/6$

$\text{GY } 4/3$

$2\text{ Y } 3/4$

$7\text{ Y } 3/2$

$2\text{ Y } 2/4$

$\text{GY } 2/3$



Brown, Antique Finish

26×40 , 130 lbs., Substance No. 65



MILLCRAFT COVERS are manufactured as follows:

White and six colors.

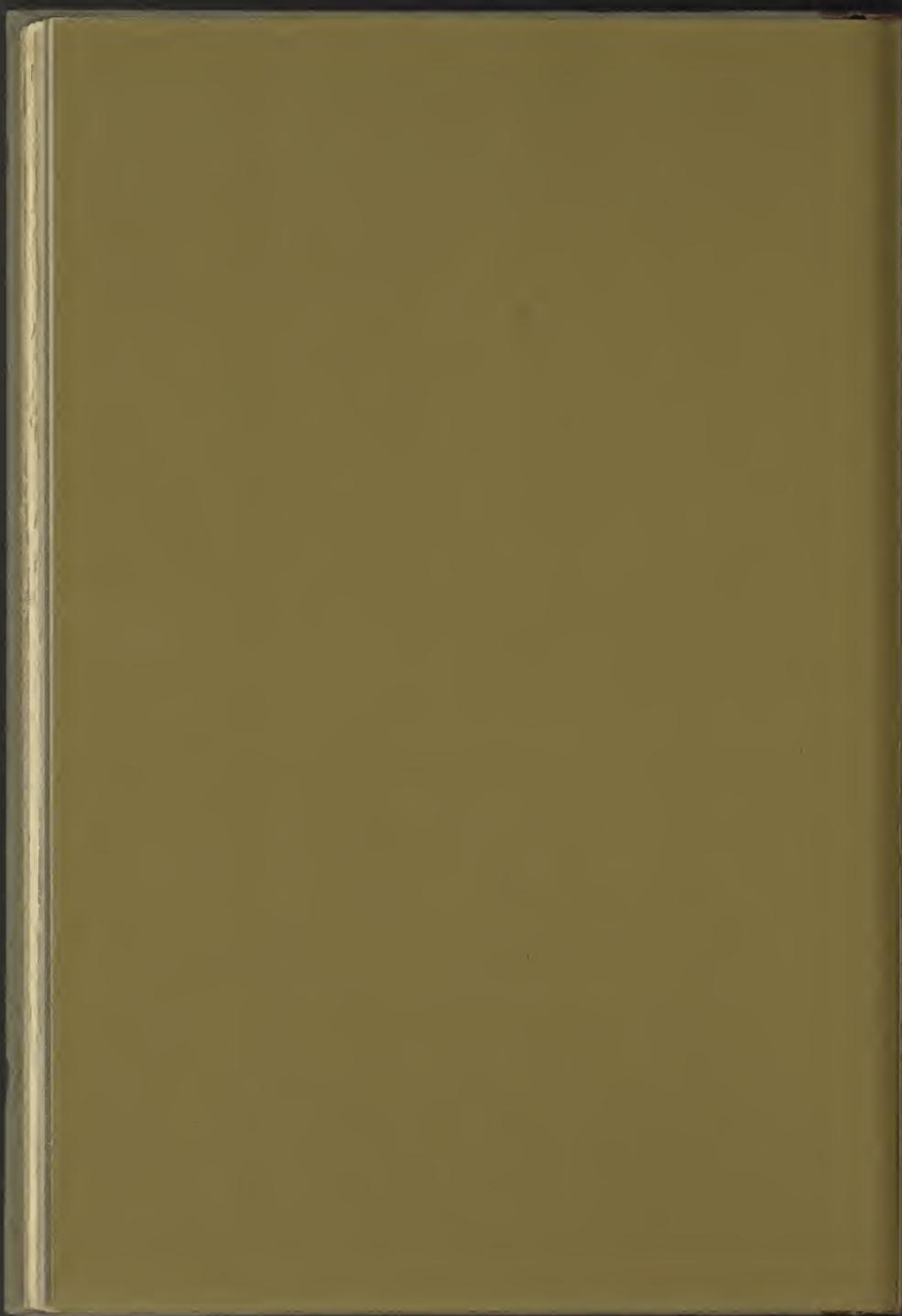
26×40 , 80 lbs., Substance No. 40.

26×40 , 130 lbs., Substance No. 65.

26×40 , Heavyweight, Substance No. 65 Pasted.

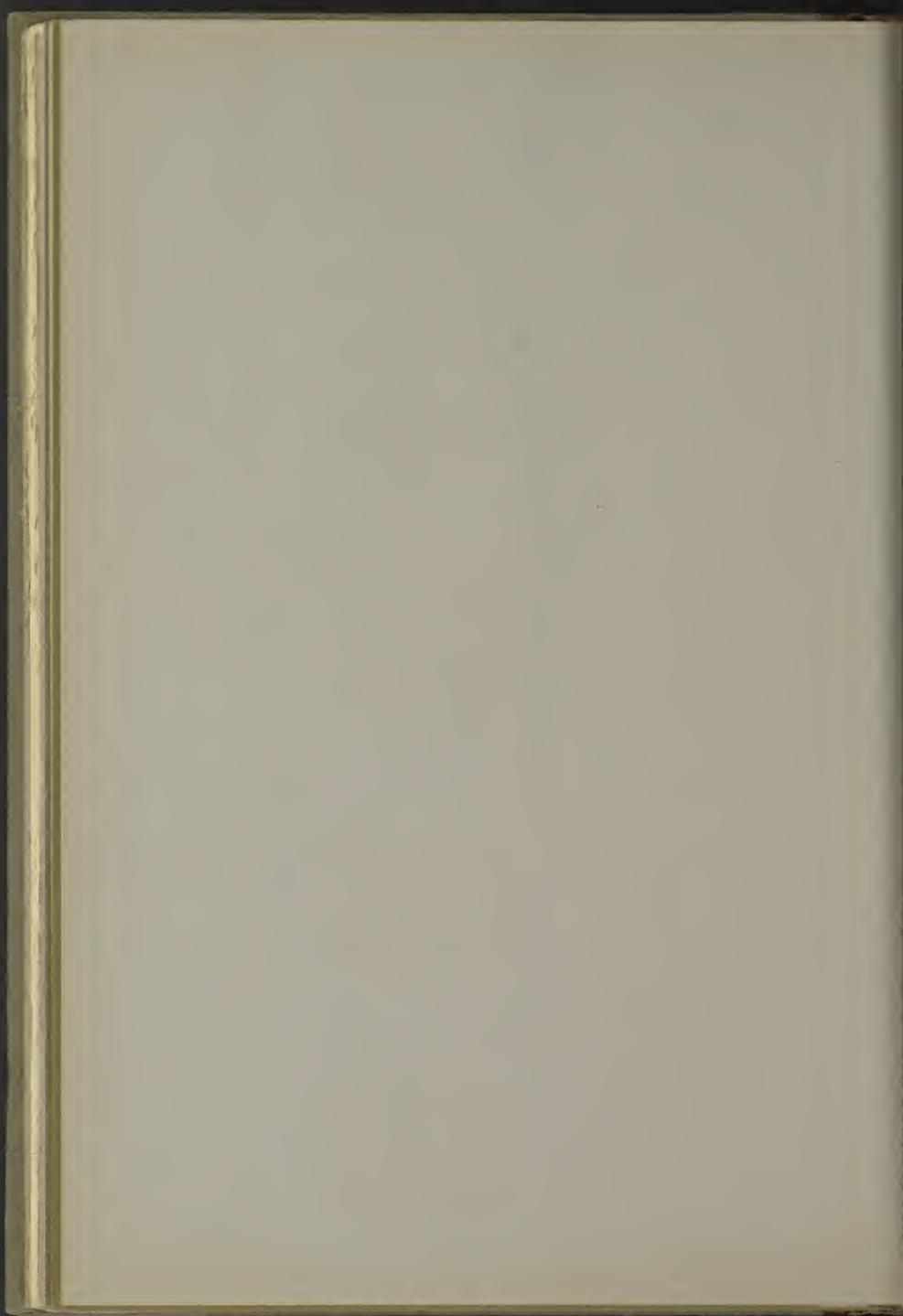
Deckle Edges and Grain are 40 inch way of the sheet. 500 sheets to a ream.

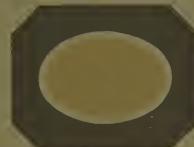
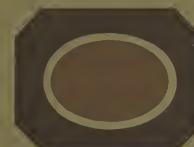
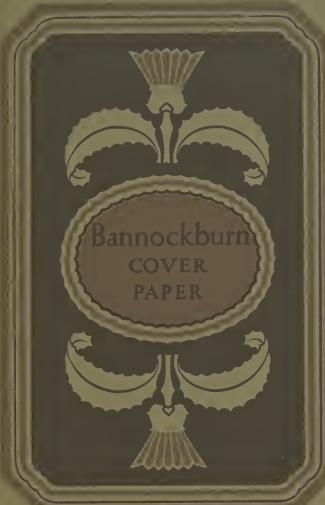
Special Finishes can be supplied in
5 ream lots of a color.





Bannockburn Cover
Grouse Drab



GY $\frac{3}{2}$ Y $\frac{4}{6}$ 6Y $\frac{3}{2}$ 3Y $\frac{5}{5}$ Y $\frac{2}{3}$ 2Y $\frac{4}{4}$ YR $\frac{2}{4}$ YR $\frac{3}{5}$ 7R $\frac{2}{4}$ 7R $\frac{3}{5}$ ~~Color is communicated through~~~~Color is communicated through~~

Grouse Drab

26 x 20, Lightweight, Substance No. 50

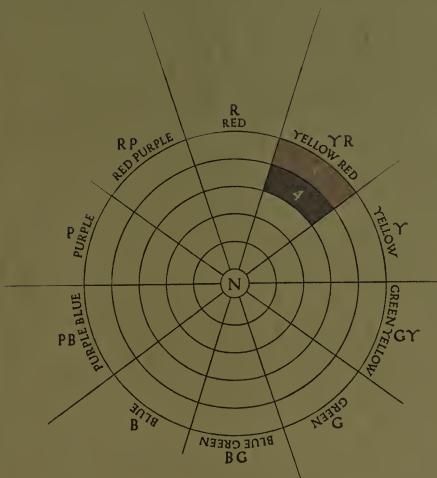


BANNOCKBURN COVER is manufactured as follows:

White and seven colors.

Lightweight, 26 x 20; Substance No. 50.
Heavyweight, 26 x 20; Substance No. 50 Pasted.Deckle Edges and Grain 20 inch way of the sheet.
500 sheets to a ream.





THE colors printed on this sheet all lie within the field of hues, extending somewhat more than a quarter way around the circle, from GREEN-YELLOW at one extremity, to the intermediary point—7 RED at the other. Their relation to the paper is established through the fact that the hue of the paper, which is 3 YELLOW, lies about midway in this field.

On the flaps, the colors, of the outer areas, all of the same low value, range from GREEN-YELLOW at the top through various steps of hue and chroma, to 7 RED at the bottom. In the inner areas, they are all of the same, or of neighboring hues to their respective outer areas, ranging from YELLOW of medium value and chroma at the top to 7 RED again at the bottom, through various steps of hue, value and chroma.

The decorative design is printed in the colors of the fourth flap from the top, the positions of which, in the scales of hue and chroma, are shown on the diagram above.

GY $\frac{2}{2}$

Y $\frac{4}{6}$

6Y $\frac{2}{2}$

3Y $\frac{5}{5}$

Y $\frac{2}{3}$

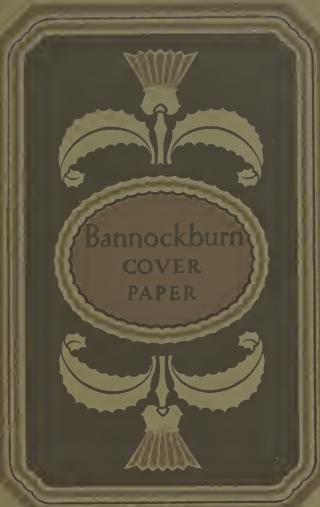
2Y $\frac{4}{4}$

YR $\frac{2}{4}$

YR $\frac{3}{5}$

7R $\frac{2}{4}$

7R $\frac{3}{5}$



Grouse Drab

26 x 20, Lightweight, Substance No. 50



BANNOCKBURN COVER is manufactured as follows:

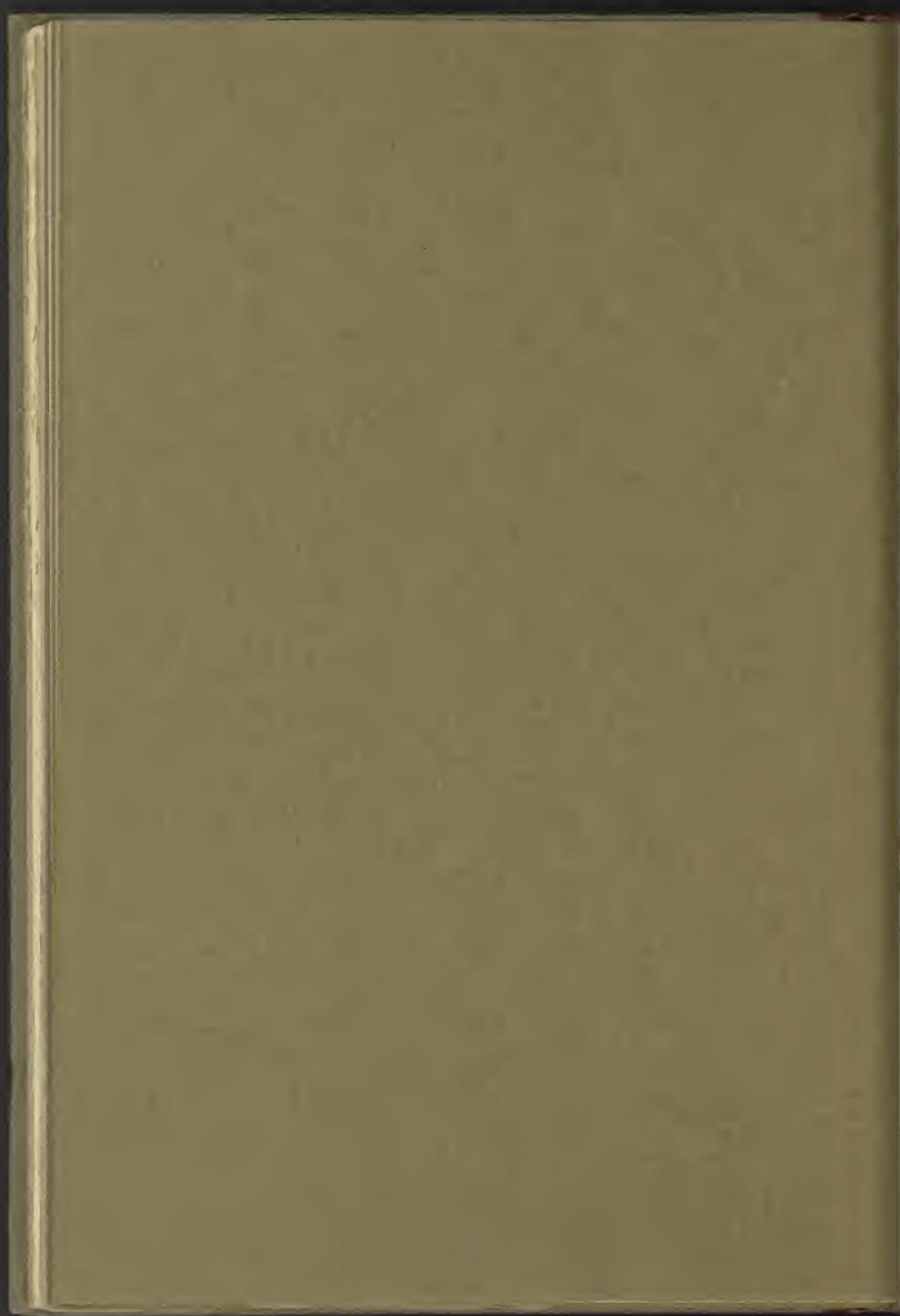
White and seven colors.

Lightweight, 26 x 20; Substance No. 50.

Heavyweight, 26 x 20; Substance No. 50 Pasted.

Dekle Edges and Grain 20 inch way of the sheet.
500 sheets to a ream.





Shrub



Rhododendron Cover

MATTHEW DRAN

Autumn, 1900





Y 3/3

R 5/1



3Y 3/3

7R 5/1



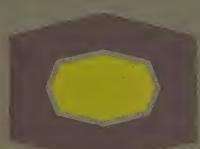
YR 3/4

YR 5/8



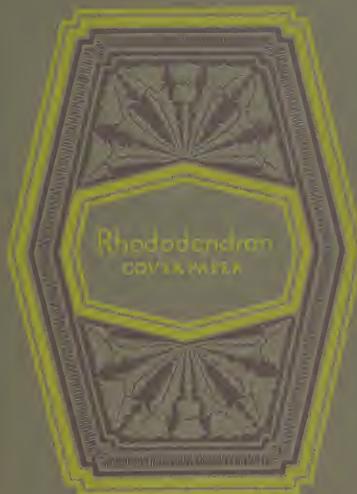
7R 3/3

3Y 6/6



R 3/4

Y 6/7



Marine Drab, Antique Finish
65 lbs., Substance No. 65



RHODODENDRON COVERS are manufactured as follows:

White and twelve colors.

20 $\frac{1}{2}$ x 26, 35 lbs., Substance No. 35.

20 $\frac{1}{2}$ x 26, 65 lbs., Substance No. 65.

20 $\frac{1}{2}$ x 26, Heavyweight, Substance No. 65 Pasted.

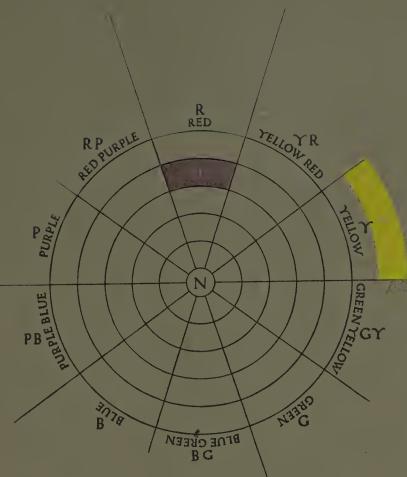
Antique and Telanian Finishes.

Deckle Edges and Grain long way of sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.







THE colors printed on this sheet all lie within the field of hues from RED to YELLOW, and they serve to illustrate the variety which may be obtained within such a restricted field.

On the flaps the colors of the outer areas, all low in value and weak in chroma, range from YELLOW at the top, through regular intermediary steps to RED at the bottom. The colors of the inner areas are all of higher value and stronger chroma, and run counterwise in hue to the outer areas, the RED being at the top and the YELLOW at the bottom. These two opposing progressions of hue meet and cross at the middle flap where the hue of the inner and outer areas is consequently the same—YELLOW-RED.

The decorative design is printed in the colors of the bottom flap, the positions of which, in the scales of hue and chroma, are indicated on the above diagram.

Y $\frac{3}{3}$

R $\frac{5}{7}$

3Y $\frac{3}{3}$

7R $\frac{5}{7}$

YR $\frac{3}{4}$

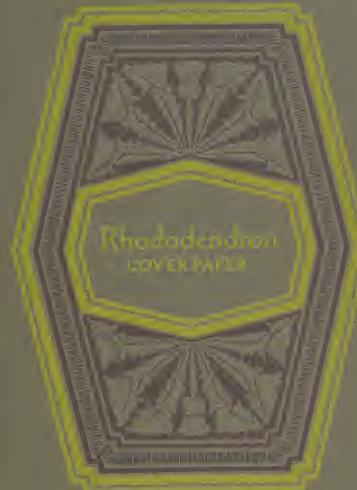
YR $\frac{5}{8}$

7R $\frac{3}{3}$

3Y $\frac{6}{7}$

R $\frac{3}{4}$

Y $\frac{6}{7}$



Marine Drab, Antique Finish
65 lbs., Substance No. 65



RHODODENDRON COVERS are manufactured as follows:

White and twelve colors.

$20\frac{1}{2} \times 26$, 35 lbs., Substance No. 35.

$20\frac{1}{2} \times 26$, 65 lbs., Substance No. 65.

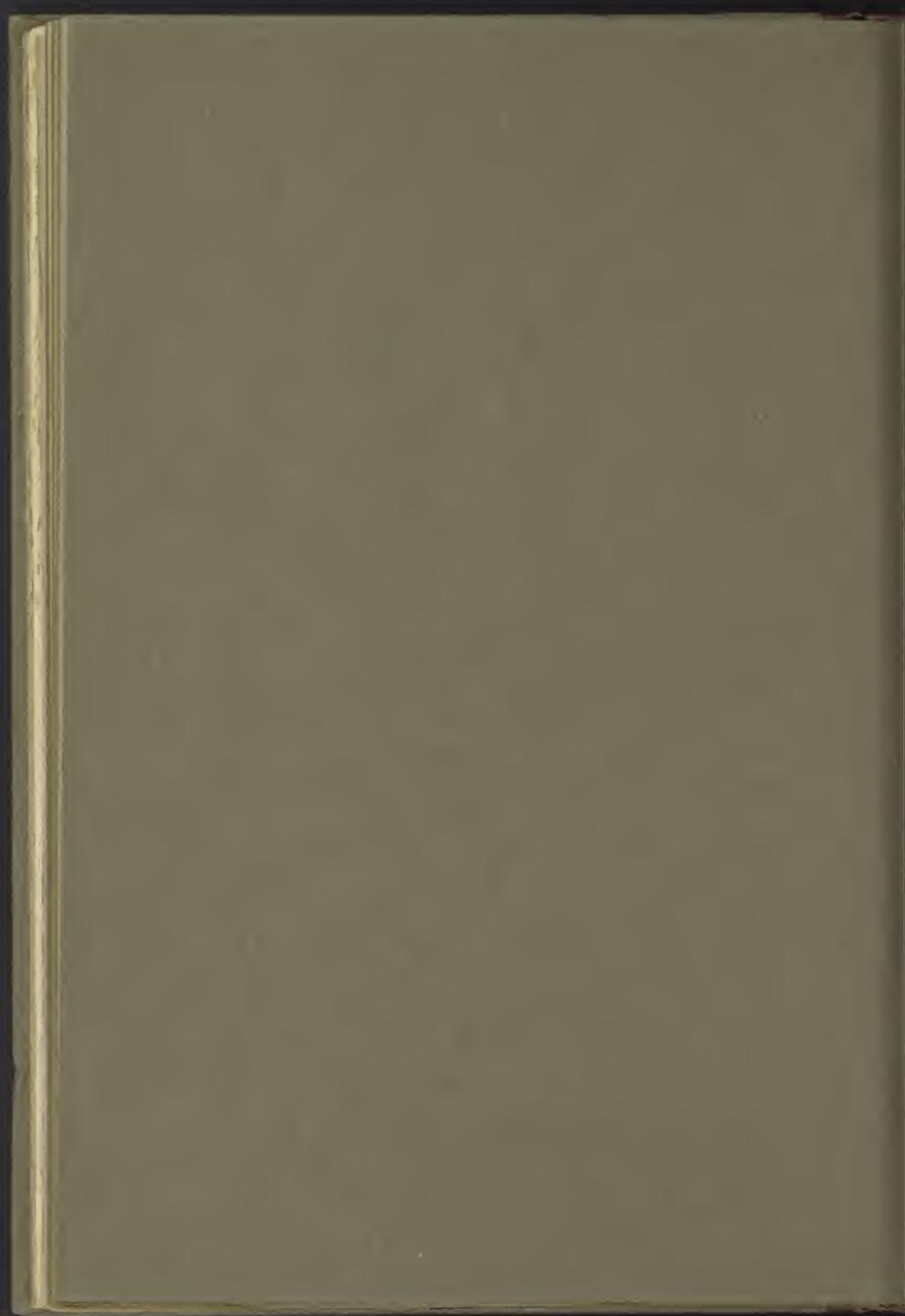
$20\frac{1}{2} \times 26$, Heavyweight, Substance No. 65 Pasted.

Antique and Telanian Finishes.

Deckle Edges and Grain long way of sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.





Sheet 8



Old Stratford Parchment Cover

Beige

Antique Finish





PB $\frac{7}{10}$

Y $\frac{8}{10}$



PB $\frac{6}{7}$

Y $\frac{7}{9}$



PB $\frac{5}{8}$

Y $\frac{6}{8}$

Beige and YELLOW.



PB $\frac{4}{8}$

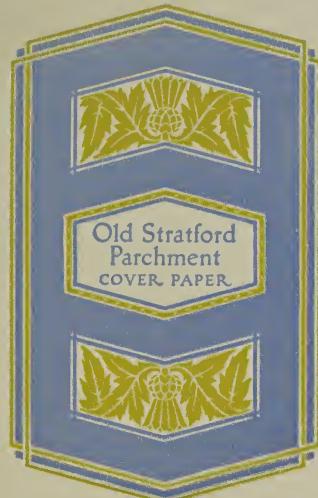
Y $\frac{5}{5}$

are of equal chroma, but



PB $\frac{3}{6}$

Y $\frac{4}{5}$



Beige, Antique Finish
20½ x 26, Lightweight, Substance No. 65

OLD STRATFORD PARCHMENT COVERS are manufactured as follows:

White and five colors.

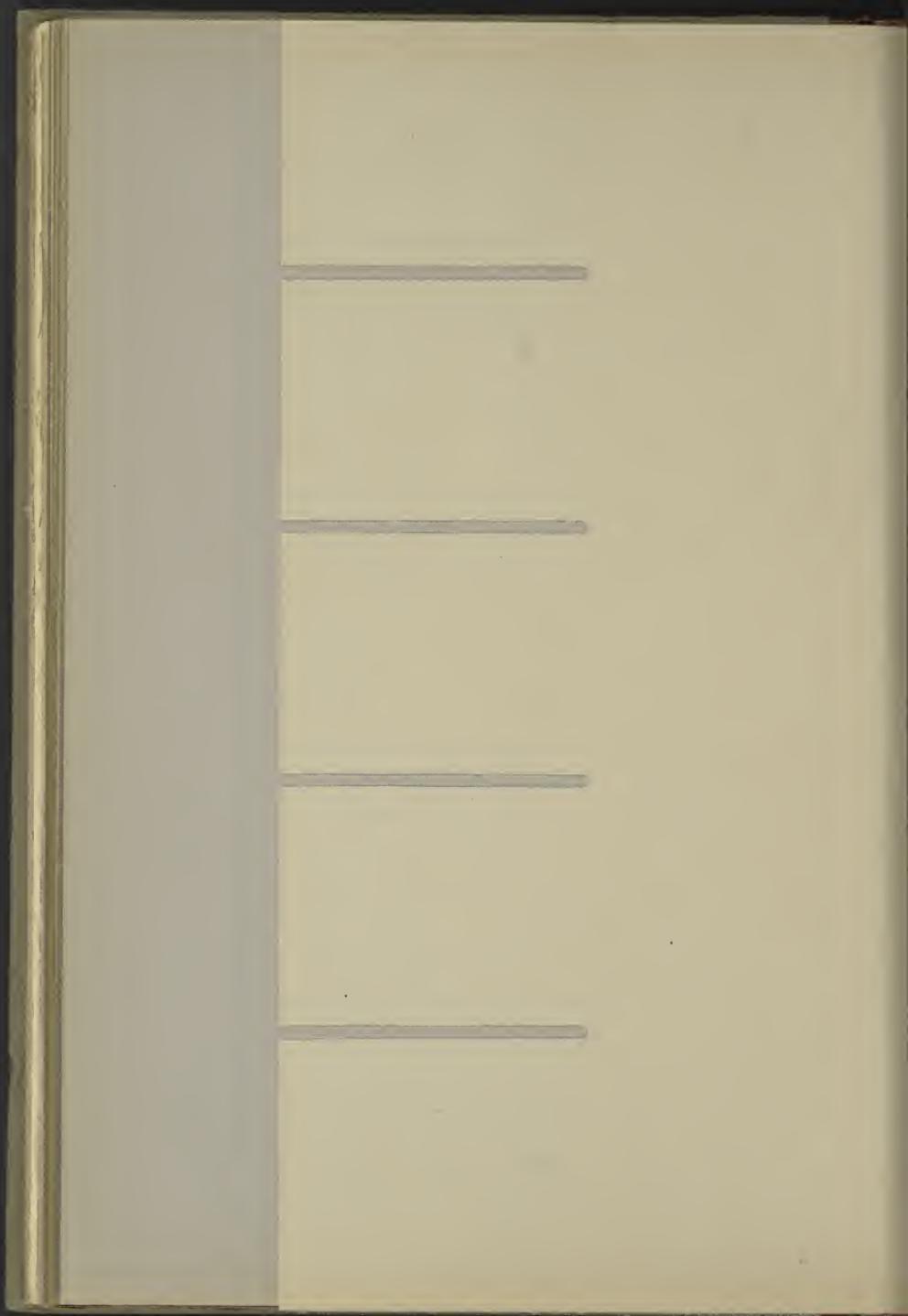
Lightweight, 20½ x 26; Substance No. 65.
Heavyweight, 20½ x 26; Substance No. 65, Pasted.

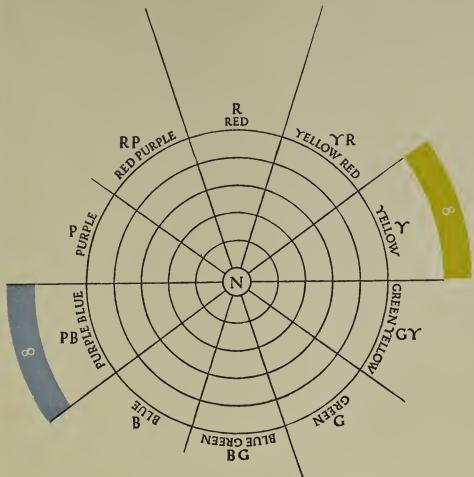
Antique, Ripple and Crash Finishes.

Deckle Edges and Grain long way of the sheet,
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.







THE colors printed on this sheet are of hues directly opposite to each other, as shown upon the above diagram, i.e., PURPLE-BLUE and YELLOW.

The colors printed on the flaps range, in the outer areas, from a high value of PURPLE-BLUE at the top, to a low value of PURPLE-BLUE at the bottom; and in the inner areas, from a high value and strong chroma of YELLOW at the top, to a low value and weak chroma of YELLOW at the bottom.

The color of high value and strong chroma should cover less area than the color of low value and weak chroma. For example, the two colors printed on the diagram, which are the colors of the middle flap, are of equal chroma, but P-B 5/8 is of lower value than Y 6/8 and therefore covers the larger area.

PB 7/6

Y 8/10

PB 6/7

Y 7/9

PB 5/8

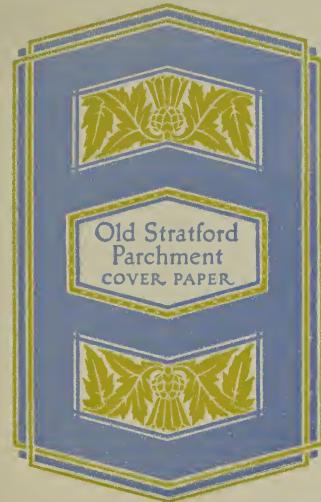
Y 6/8

PB 4/8

Y 5/5

PB 3/6

Y 4/5



Beige, Antique Finish
20½ x 26, Lightweight, Substance No. 65

OLD STRATFORD PARCHMENT COVERS are manufactured as follows:

White and five colors.

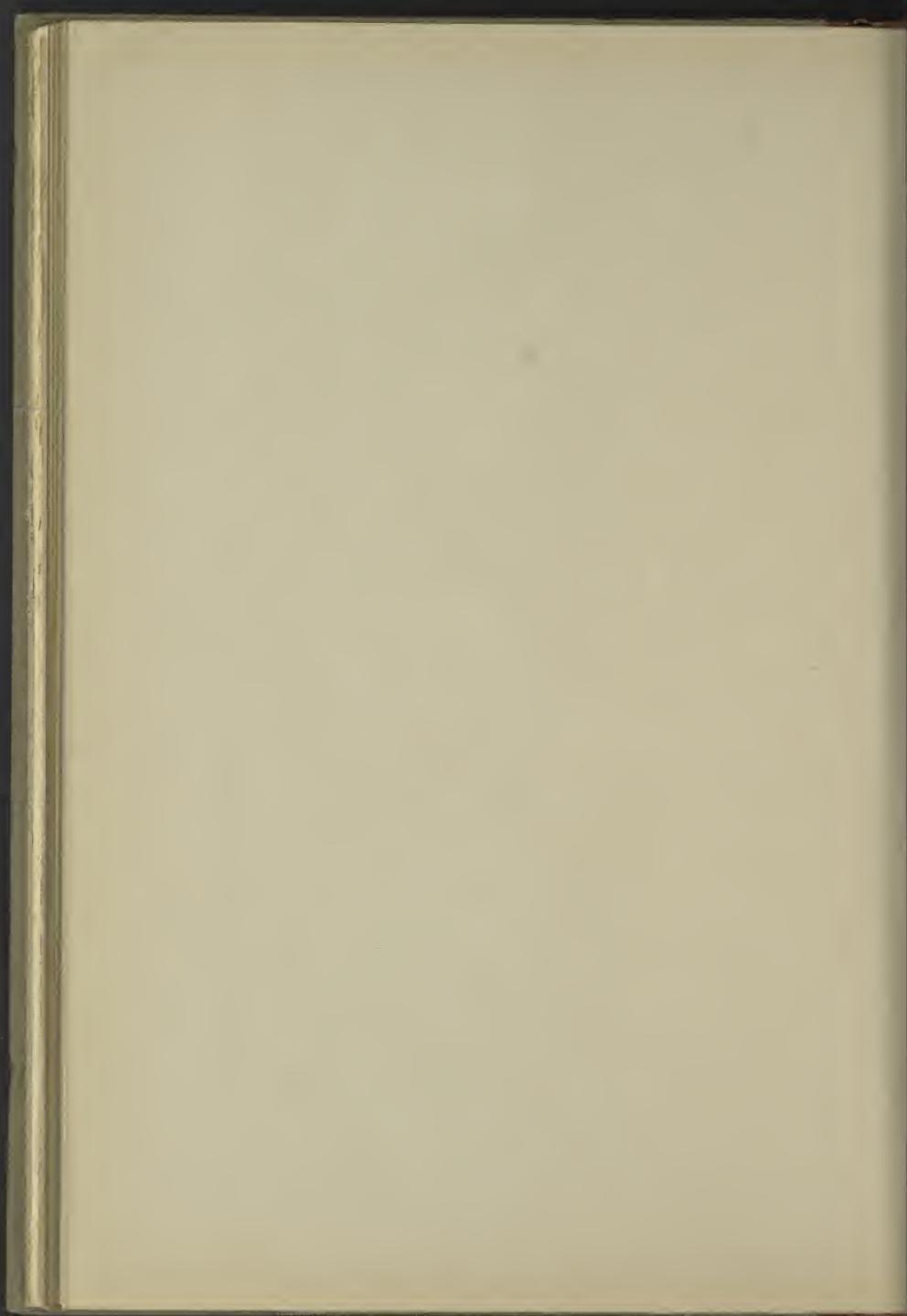
Lightweight, 20½ x 26; Substance No. 65.
Heavyweight, 20½ x 26; Substance No. 65, Pasted.

Antique, Ripple and Crash Finishes.

Deckle Edges and Grain long way of the sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.





Sheet 9



Strathmore De Luxe

Cream





B $\frac{1}{5}$

YR $\frac{7}{5}$



7B $\frac{6}{5}$

3Y $\frac{6}{5}$



PB $\frac{5}{5}$

Y $\frac{5}{5}$

is on the flaps is of directly



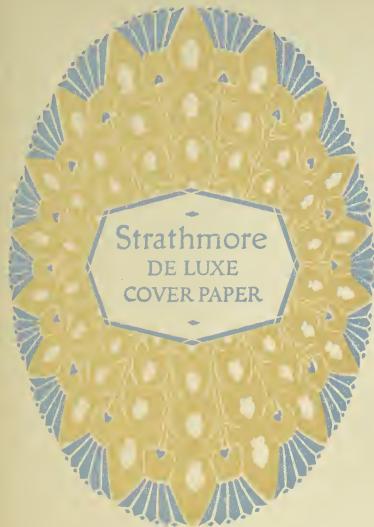
3P $\frac{4}{5}$

7Y $\frac{4}{5}$



P $\frac{3}{5}$

GY $\frac{3}{4}$



Cream, $25\frac{1}{2} \times 20$, Coverweight

STRATHMORE DE LUXE is manufactured as follows:

White and three colors.

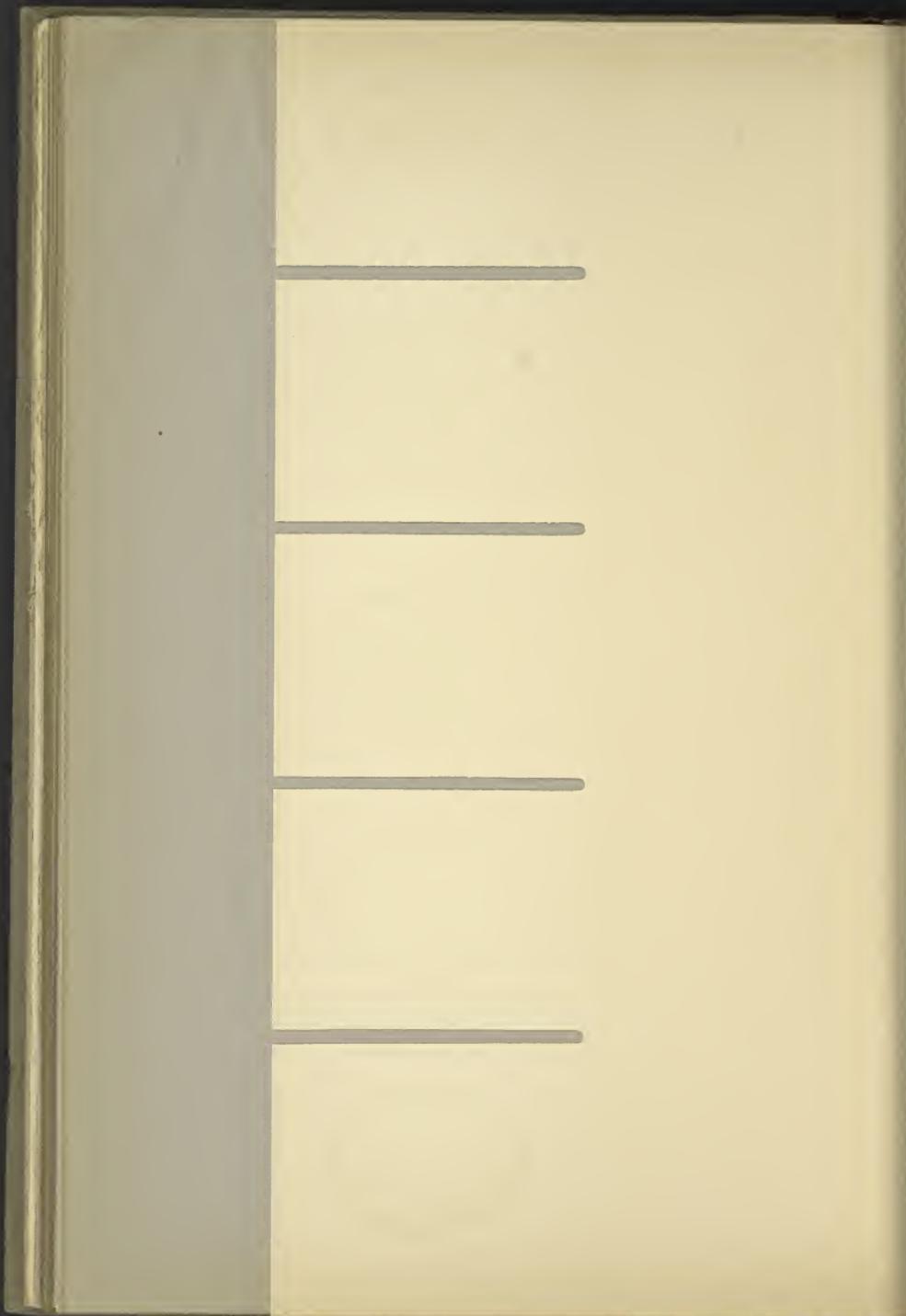
Bookweight, 24×38 .

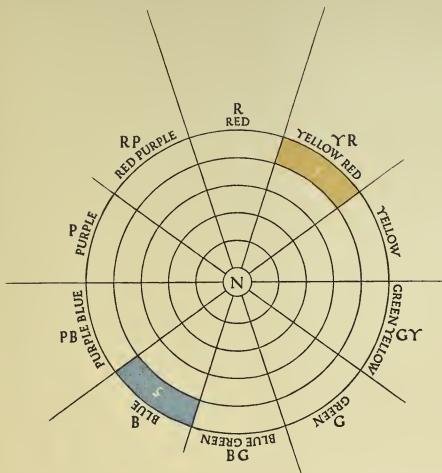
Deckle Edges and Grain 38 inch way of sheet.

Coverweight, $25\frac{1}{2} \times 20$.

Deckle Edges and Grain 20 inch way of sheet.







This sheet presents a series of colors lying in directly opposite fields of hue, i.e., YELLOW-RED to GREEN-YELLOW on one side, and BLUE to PURPLE on the other.

Each pair of colors in the areas on the flaps is of directly opposite hues; and the colors of each pair are of the same value and chroma, except on the bottom flap. In the outer areas, they range from a high value of BLUE at the top, through intermediary steps of hue, to a low value of PURPLE at the bottom. In the inner areas, they range from a high value of YELLOW-RED at the top, through intermediary steps of hue, to a low value of GREEN-YELLOW at the bottom. All are of medium chroma.

The paper being YELLOW 9/2, its hue lies directly in the center of one field, and directly opposite the center of the other.

The decorative design is printed in the colors of the top flap, B 7/5 and Y-R 7/5 the positions of which, in the scales of hue and chroma, are shown on the diagram above.

(B 7/5)

(YR 7/5)

(7B 6/5)

(3Y 6/5)

(PB 5/5)

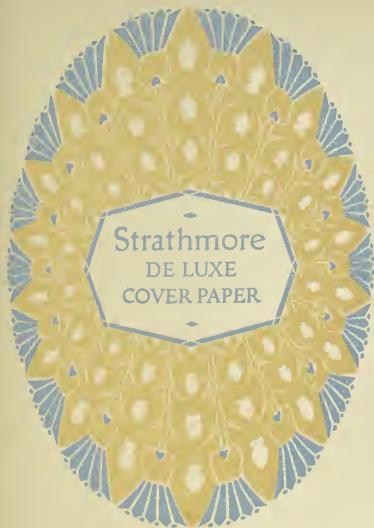
(Y 5/5)

(3P 4/5)

(7Y 4/5)

(P 3/5)

(GY 3/4)



Cream, 25 1/2 x 20, Coverweight



STRATHMORE DE LUXE is manufactured as follows:

White and three colors.

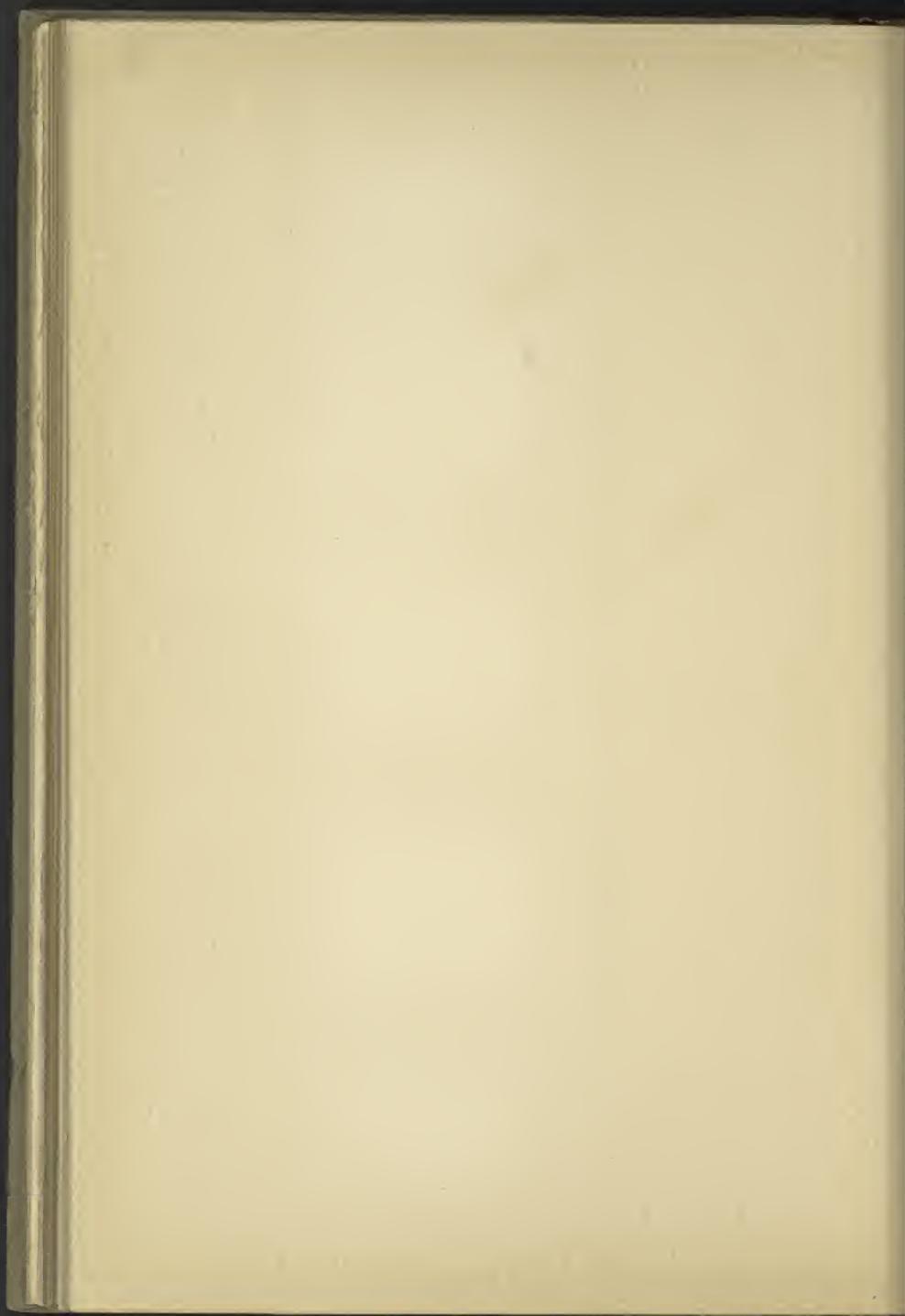
Bookweight, 24 x 38.

Deckle Edges and Grain 38 inch way of sheet.

Coverweight, 25 1/2 x 20.

Deckle Edges and Grain 20 inch way of sheet.





7

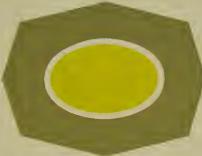
Strathmore De Luxe
buff





Y 5/4

Y 8/9



Y 4/5

Y 6/8



Y 4/3

Y 6/7

on the flaps are all YEL.



Y 2/2

Y 4/6



Y 1/3

Y 6/3



Buff, 25½ x 20, Coverweight



STRATHMORE DE LUXE is manufactured as follows:

White and three colors.

Bookweight, 24 x 38.

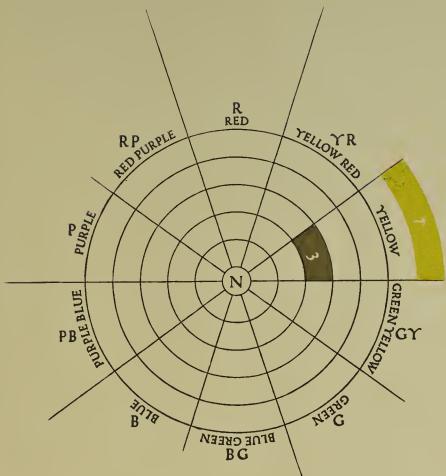
Deckle Edges and Grain 38 inch way of sheet.

Coverweight, 25½ x 20.

Deckle Edges and Grain 20 inch way of sheet.







THIS sheet presents a range of colors all obtained from the single hue—YELLOW. The paper is also YELLOW in hue, of high value and weak chroma.

The colors of the outer areas on the flaps are all YELLOW of weak chroma, ranging from middle value at the top to the lowest step of value at the bottom. The inner areas range from a very high value and strong chroma of YELLOW at the top, through varying steps of value and chroma, to a high value and very weak chroma at the bottom.

The decorative design is printed in the colors of the middle flap, Y 4/3 and Y 6/7, the positions of which, in the scales of hue and chroma, are shown on the diagram above.

(Y 5/4)

(Y 8/9)

(Y 4/5)

(Y 6/8)

(Y 4/3)

(Y 6/7)

(Y 2/2)

(Y 4/6)

(Y 1/3)

(Y 6/3)



Buff, 25½ x 20, Coverweight



STRATHMORE DE LUXE is manufactured as follows:

White and three colors.

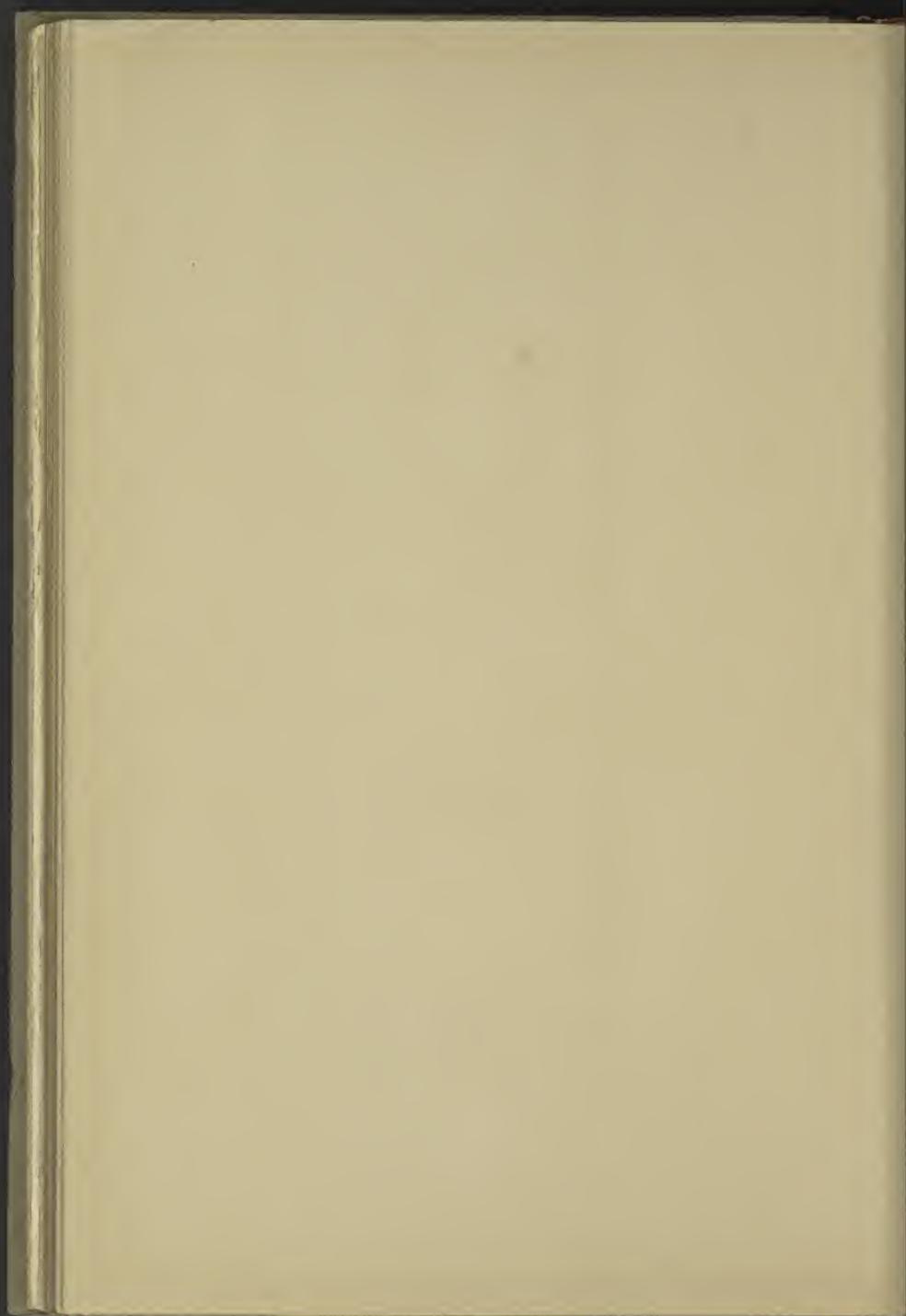
Bookweight, 24 x 38.

Deckle Edges and Grain 38 inch way of sheet.

Coverweight, 25½ x 20.

Deckle Edges and Grain 20 inch way of sheet.



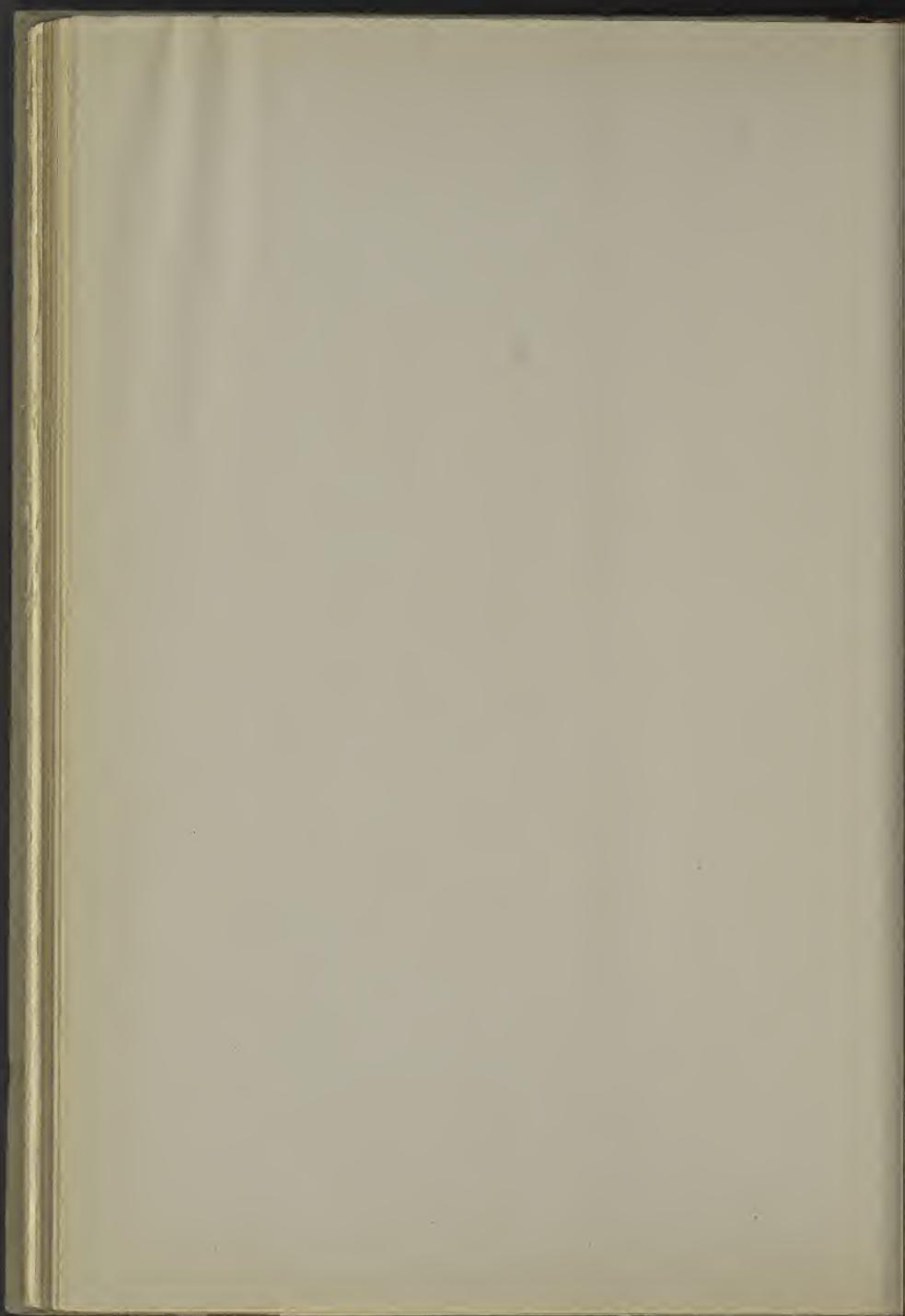




Old Stratford Parchment Cover

Buff

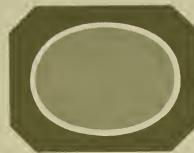
Ripple Finish





7R 4/5

7R 6/4



Y 3/5

Y 6/3



G 3/5

G 6/2

Extreme of the range



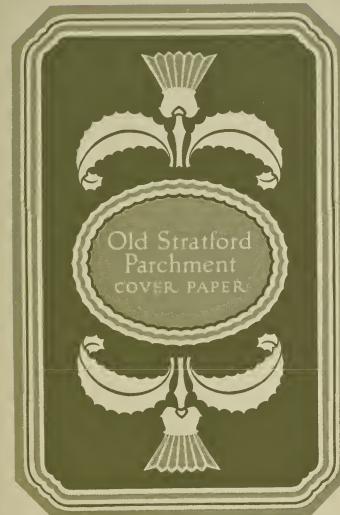
B 3/6

B 6/2



P 3/4

P 5/2



Buff, Ripple Finish
20½ x 26, Lightweight, Substance No. 65

OLD STRATFORD PARCHMENT COVERS are manufactured as follows:

White and six colors.

Lightweight, 20½ x 26; Substance No. 65.
Heavyweight, 20½ x 26; Substance No. 65, Pasted.

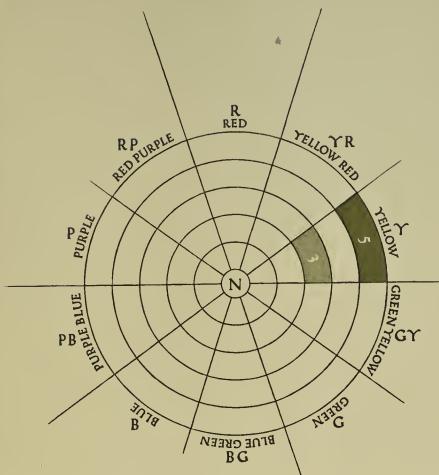
Antique and Ripple Finishes.

Deckle Edges and Grain long way of the sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.







THE colors printed on this sheet extend around slightly more than three-quarters of the entire circle of hues, i.e., from PURPLE at one extremity of the range to the intermediary 7 RED at the other.

The hue of the inner and the outer area of each pair of colors on the flaps is the same. The only difference in the colors of the inner and outer area of each pair is in value and chroma. All of the outer areas are low in value and of medium chroma, and all of the inner areas are high in value and weak in chroma.

The decorative design is printed in the colors of the second flap from the top, $Y\ 3/5$ and $Y\ 6/3$. The positions of these two colors in the scales of hue and chroma are shown on the diagram above.

$7R\ 4/5$

$7R\ 6/4$

$Y\ 3/5$

$Y\ 6/3$

$G\ 3/5$

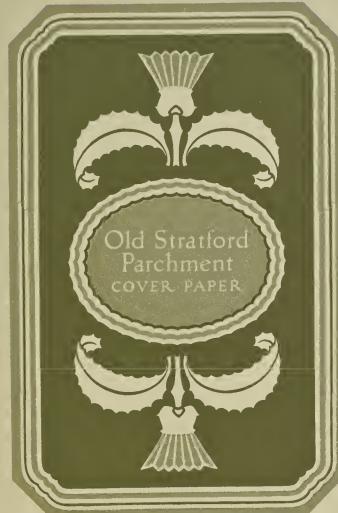
$G\ 6/2$

$B\ 3/6$

$B\ 6/2$

$P\ 3/4$

$P\ 5/2$



Buff, Ripple Finish
20 $\frac{1}{2}$ x 26, Lightweight, Substance No. 65

OLD STRATFORD PARCHMENT COVERS are manufactured as follows:

White and six colors.

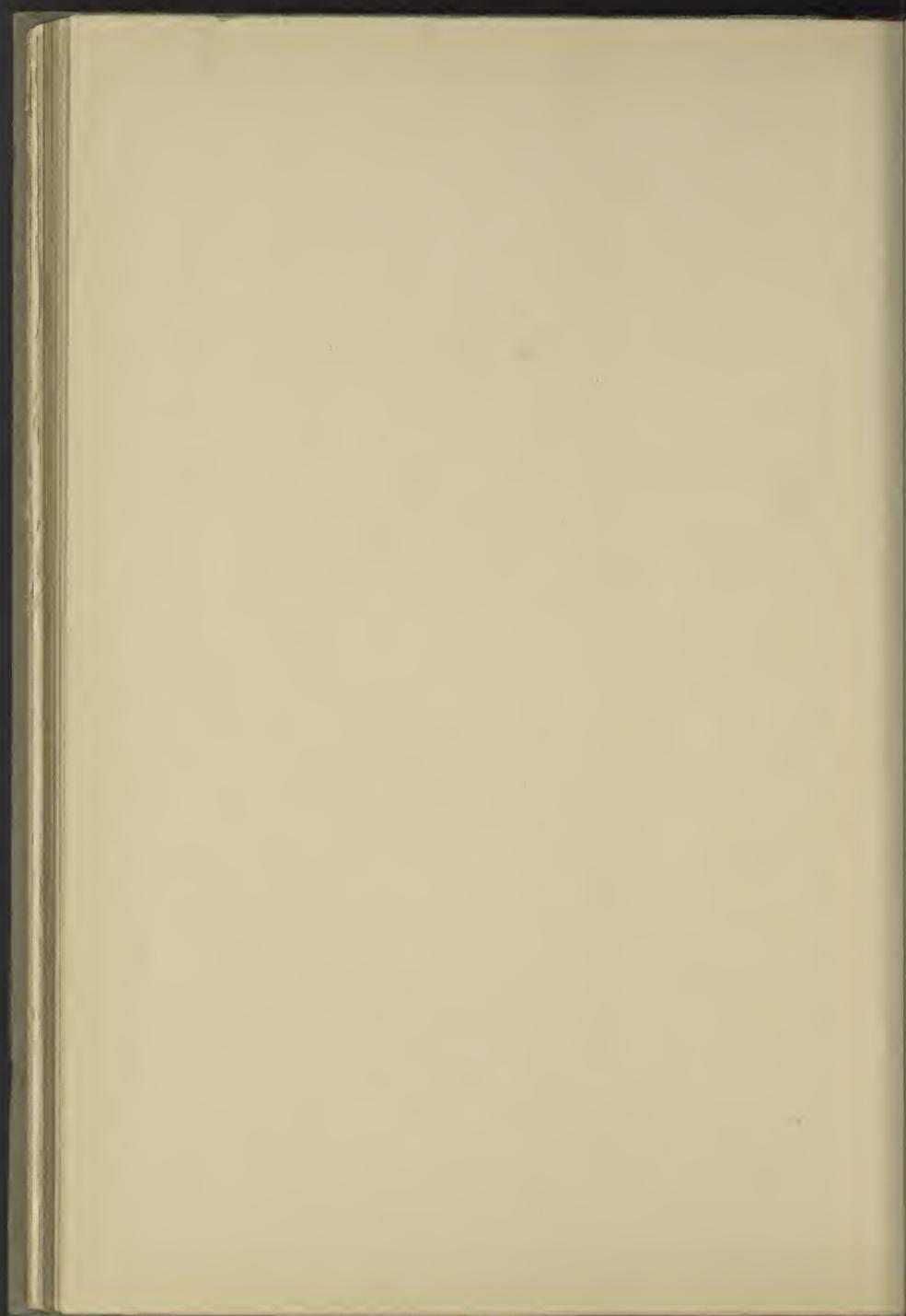
Lightweight, 20 $\frac{1}{2}$ x 26; Substance No. 65.
Heavyweight, 20 $\frac{1}{2}$ x 26; Substance No. 65, Pasted.

Antique and Ripple Finishes.

Deckle Edges and Grain long way of the sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.







Rhododendron Cover

Chocolate

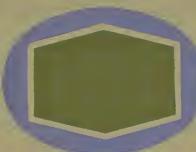
Telaian Finish





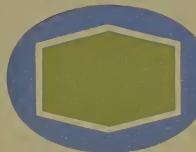
P 6/4

GY 2/4



3P 5/5

7Y 3/5



PB 4/5

Y 4/5

B to BLUE, ranging from



7B 3/5

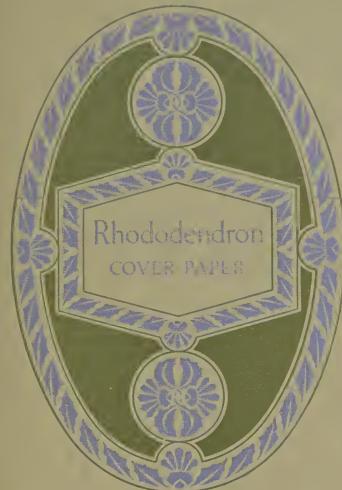
3Y 5/5

The outer areas are related



B 2/5

YR 6/5



Chocolate, Telanian Finish
65 lbs., Substance No. 65

RHODODENDRON COVERS are manufactured as follows:

White and twelve colors.

$20\frac{1}{2} \times 26$, 35 lbs., Substance No. 35.

$20\frac{1}{2} \times 26$, 65 lbs., Substance No. 65.

$20\frac{1}{2} \times 26$, Heavyweight, Substance No. 65 Pasted.

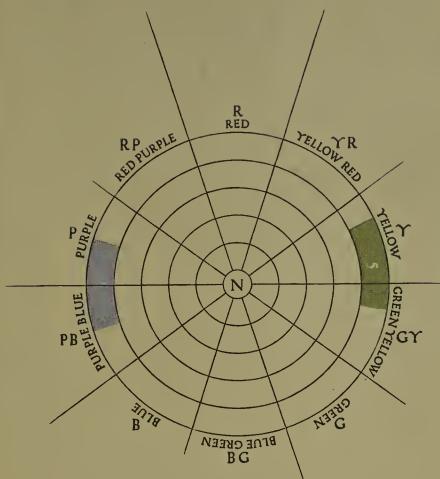
Antique and Telanian Finishes.

Deckle Edges and Grain long way of sheet.
500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color.







THE colors printed on this sheet present an arrangement of two directly opposite fields of hue, correctly balanced.

The colors of the outer areas on the flaps all lie within the field of hues from PURPLE to BLUE, ranging from a high value and medium chroma of PURPLE at the top, to a low value and medium chroma of BLUE at the bottom. The colors of the inner areas all lie within the field of hues from GREEN-YELLOW to YELLOW-RED, ranging from a low value of GREEN-YELLOW at the top to a high value of YELLOW-RED at the bottom. The hue of each outer area is the direct opposite of its respective inner area.

The paper being YELLOW, comes midway in the field of hues covered by the inner areas, and is, therefore, related to them by proximity. The outer areas are related to the paper by opposition.

The decorative design is printed in the colors of the second flap from the top, the positions of which, in the scales of hue and chroma are shown on the above diagram.

P $\frac{6}{4}$

GY $\frac{2}{4}$

3P $\frac{5}{5}$

7Y $\frac{3}{5}$

PB $\frac{4}{5}$

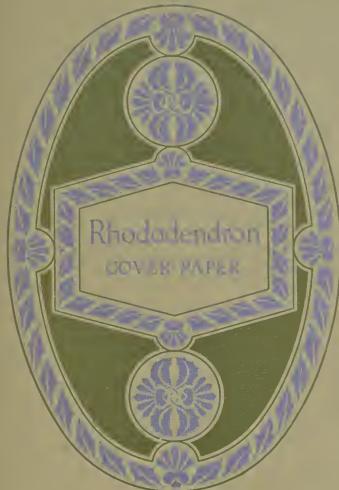
Y $\frac{4}{5}$

7B $\frac{3}{5}$

3Y $\frac{5}{5}$

B $\frac{2}{5}$

YR $\frac{6}{5}$



Chocolate, Telanian Finish
65 lbs., Substance No. 65

RHODODENDRON COVERS are manufactured as follows:

White and twelve colors.

$20\frac{1}{2} \times 26$, 35 lbs., Substance No. 35.

$20\frac{1}{2} \times 26$, 65 lbs., Substance No. 65.

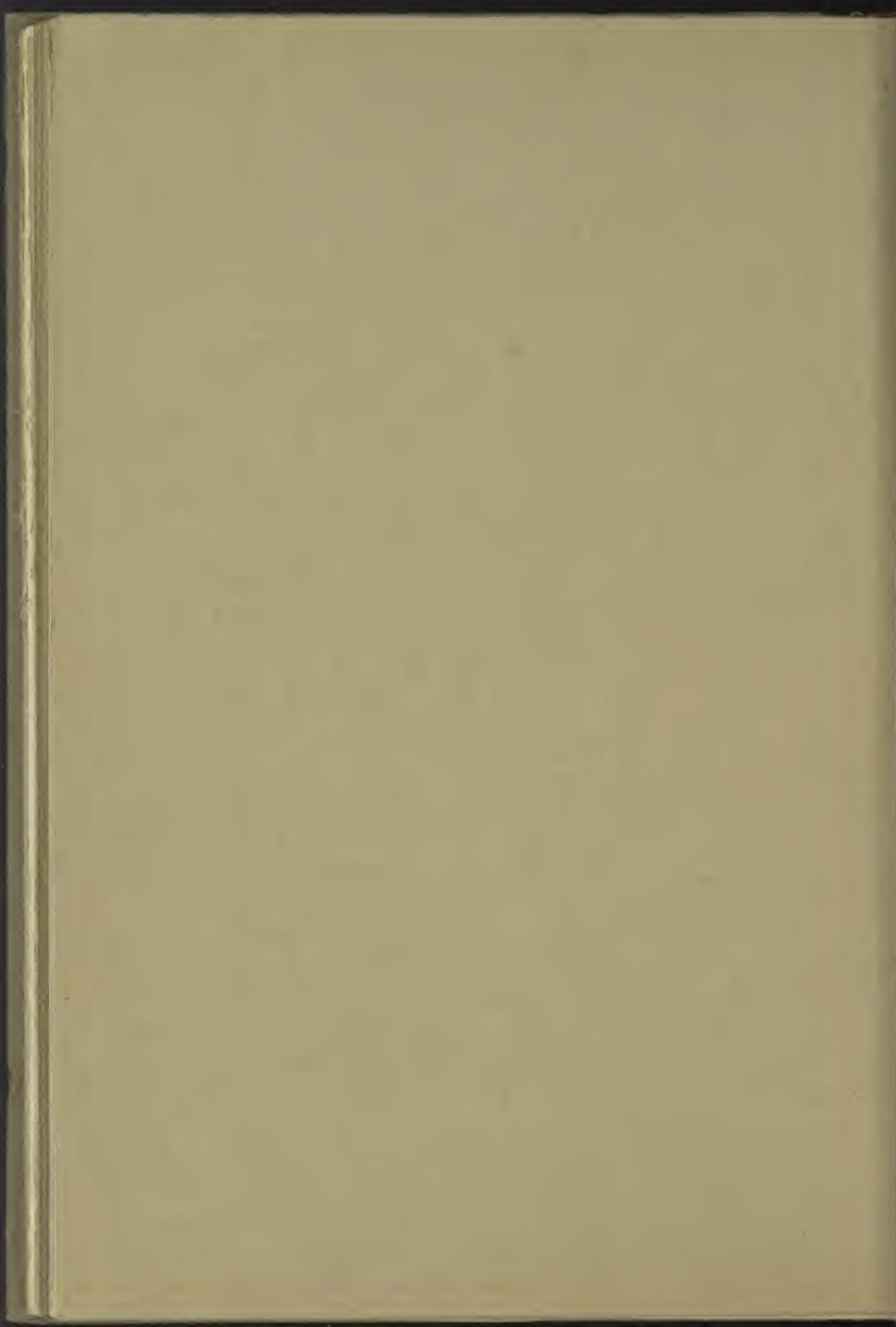
$20\frac{1}{2} \times 26$, Heavyweight, Substance No. 65 Pasted.

Antique and Telanian Finishes.

Deckle Edges and Grain long way of sheet.
500 sheets to a ream.

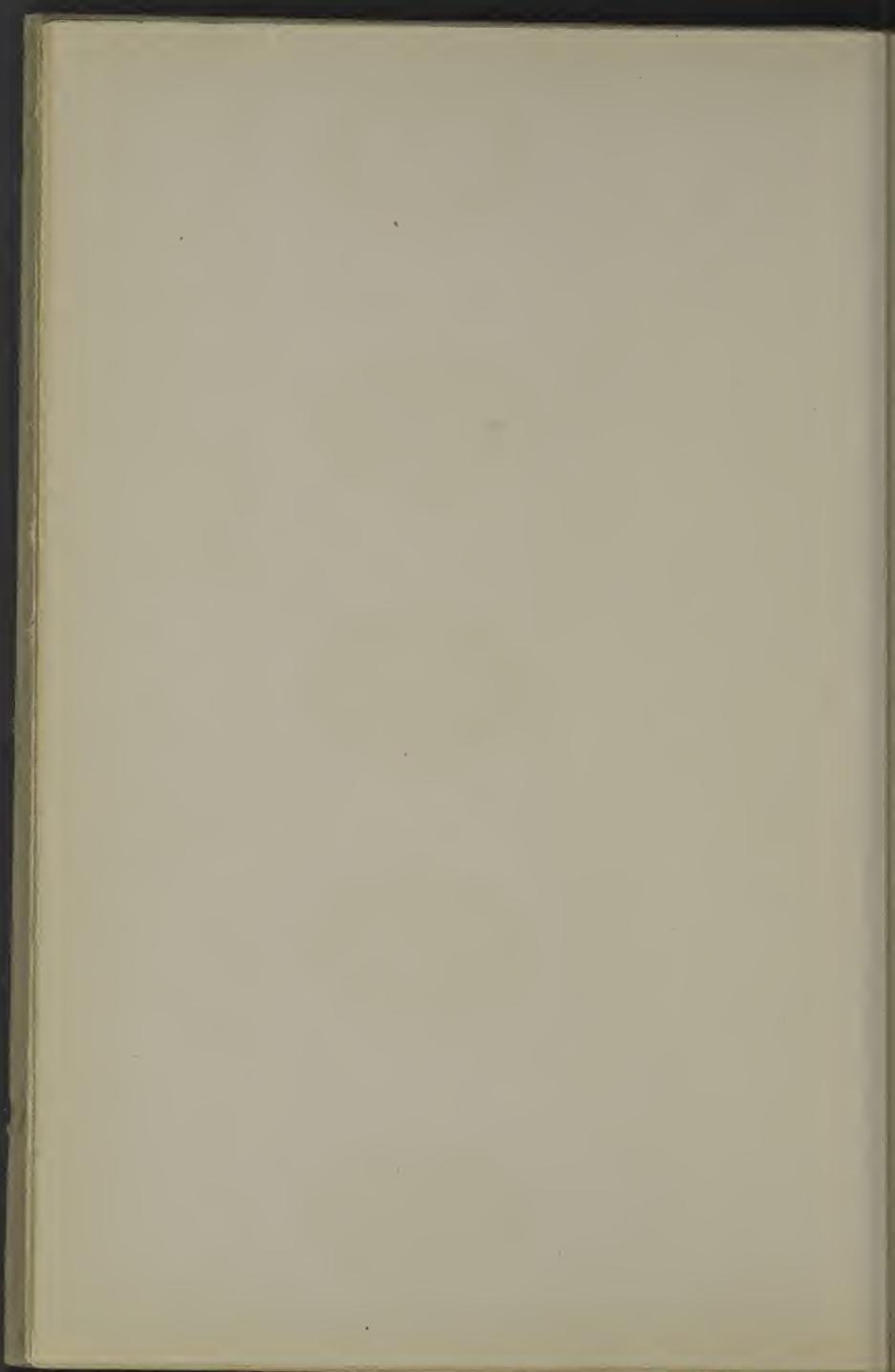
Special finishes can be supplied in
5 ream lots of a color.





Sheet 13

Strathlaid Booklet Paper
Tao





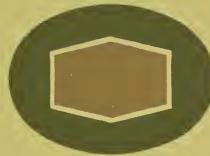
7Y 5/3

2Y 7/5



8Y 5/5

YR 6/5



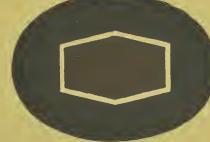
6Y 4/4

2Y 5/6



GY 3/5

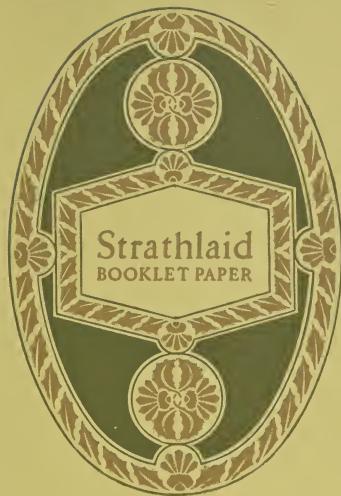
3Y 4/4



7Y 2/3

YR 3/5

the positions of which



Tan, 25 1/2 x 40, Coverweight

STRATHLAI^D BOOKLET PAPERS are manufactured
as follows:

White and four colors.

Bookweight, 25 1/2 x 40.

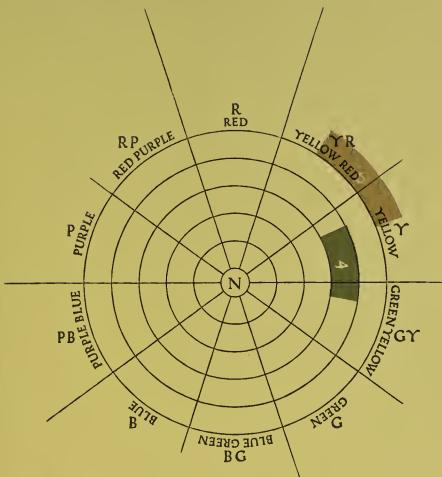
Coverweight, 25 1/2 x 40.

Deckle Edges, Marking and Grain are 40-inch
way of the sheet.

500 sheets to a ream.







ALL of the colors printed on this sheet lie within the YELLOW-RED to GREEN-YELLOW field of hues.

The colors of the outer areas on the flaps range from an intermediary hue—7YELLOW, of medium value and weak chroma, through various intermediary steps to the same hue, of very low value and weak chroma, at the bottom. In the inner areas all of the hues are restricted to the YELLOW-RED to YELLOW field, ranging from a high value and medium chroma of 2YELLOW at the top, to a low value and medium chroma of YELLOW-RED at the bottom.

The decorative design is printed in the colors of the middle flap—6Y 4/4 and 2Y 5/6, the positions of which, in the scales of hue and chroma, are shown on the above diagram.

7Y 5/3

2Y 7/5

8Y 5/5

YR 6/5

6Y 4/4

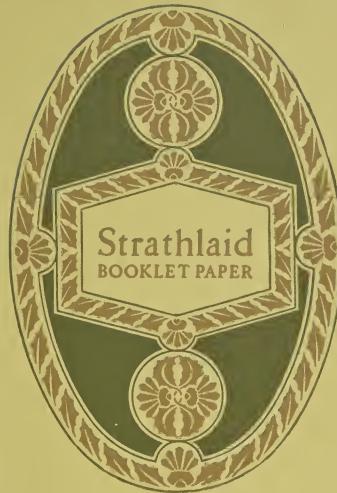
2Y 5/6

GY 3/5

3Y 4/4

7Y 2/3

YR 3/5



Tan, $25\frac{1}{2} \times 40$, Coverweight



STRATHLAIID Booklet Papers are manufactured as follows:

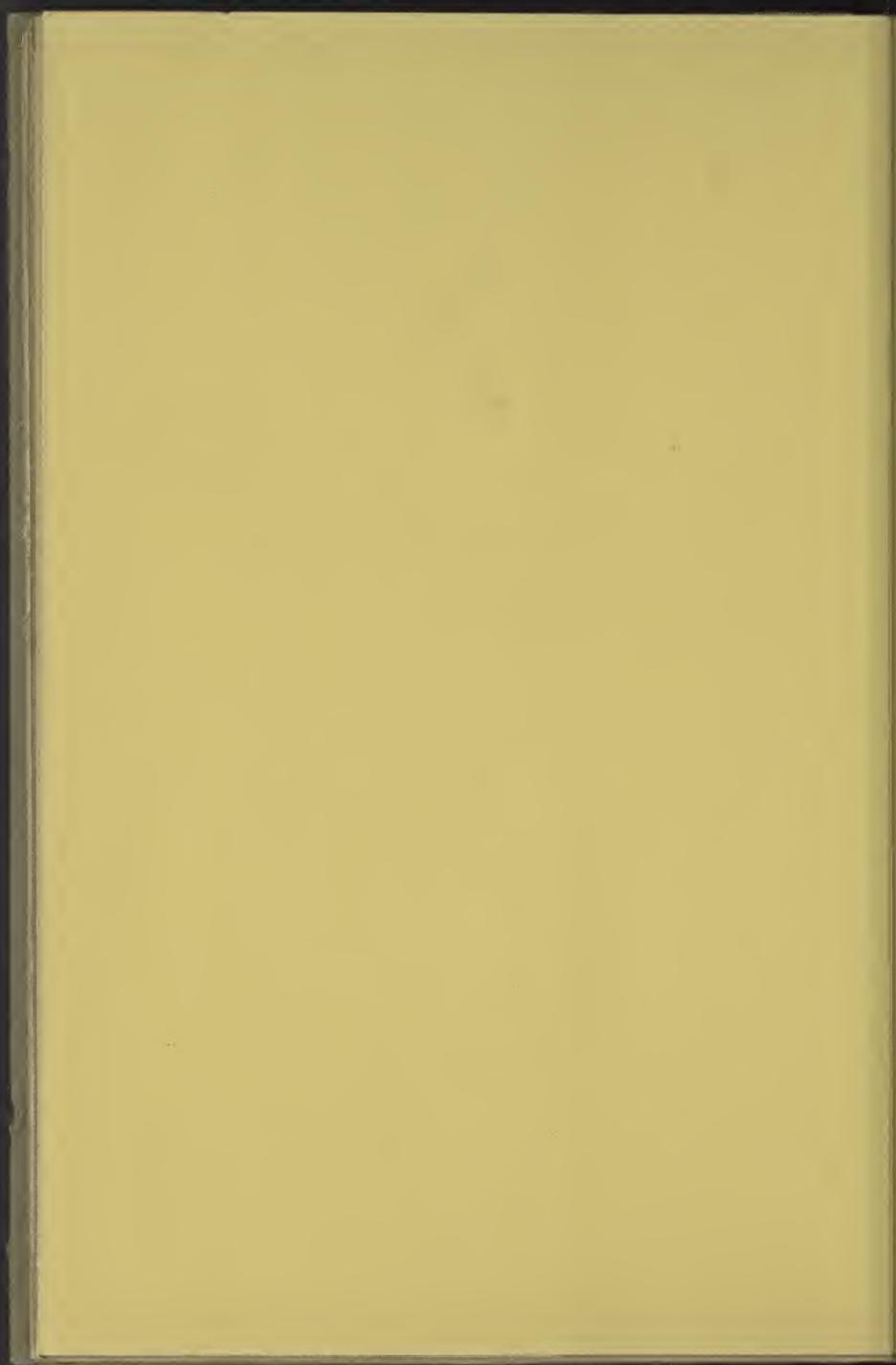
White and four colors.

Bookweight, $25\frac{1}{2} \times 40$.
Coverweight, $25\frac{1}{2} \times 40$.

Deckle Edges, Marking and Grain are 40-inch way of the sheet.

500 sheets to a ream.



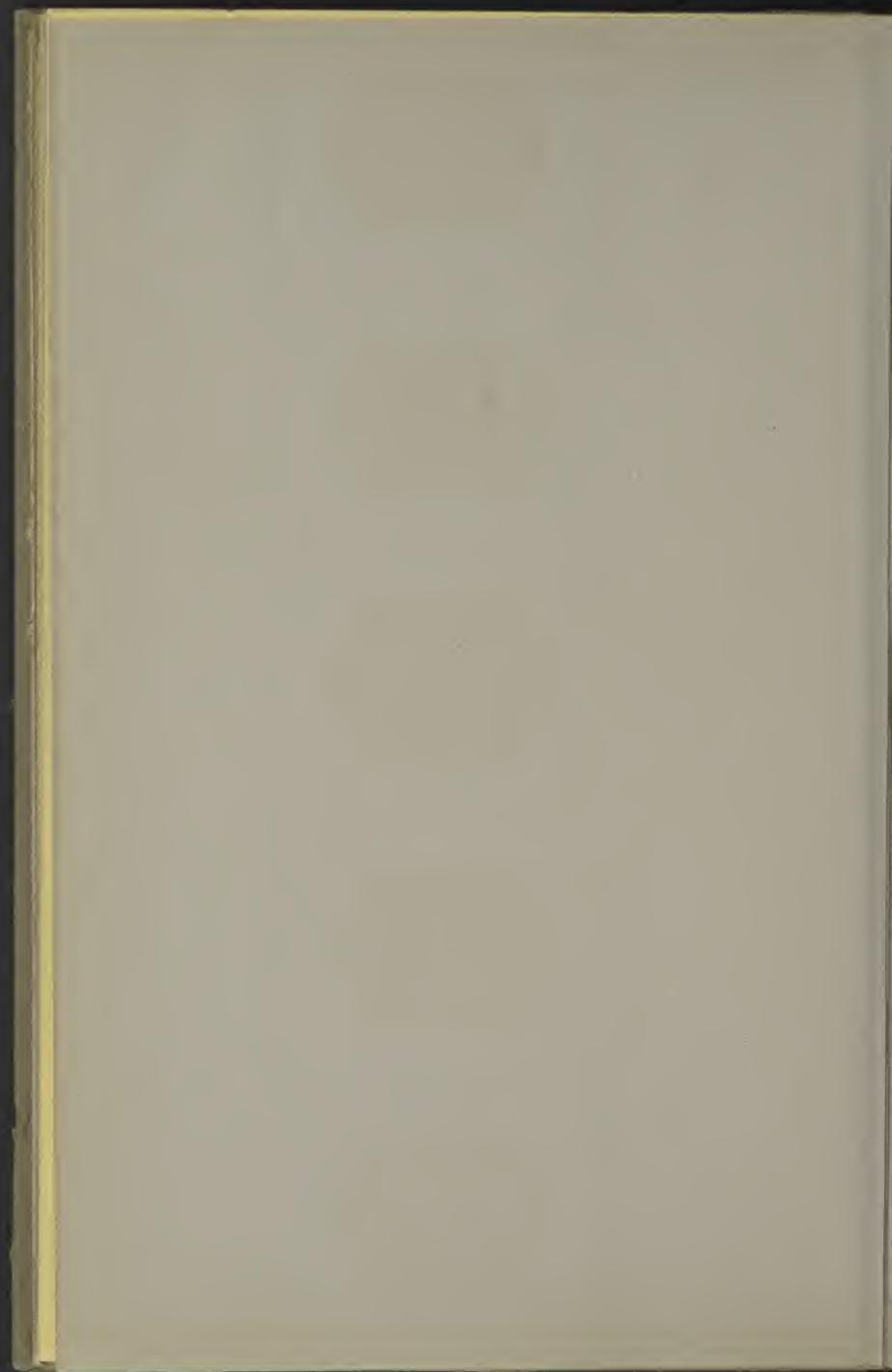


Sheet I4



Bannockburn Cover

Thistle Gray





GY $\frac{4}{6}$
3Y $\frac{6}{7}$



GY $\frac{3}{5}$
3Y $\frac{6}{6}$



GY $\frac{3}{4}$
3Y $\frac{5}{5}$

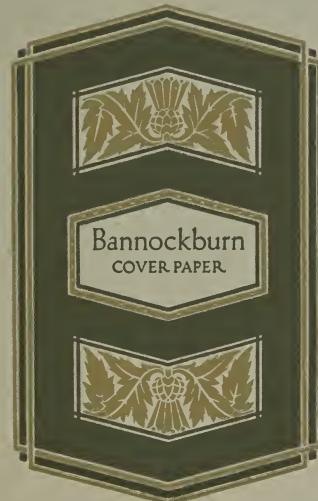


GY $\frac{2}{3}$
3Y $\frac{4}{5}$

These colors are related



GY $\frac{2}{2}$
3Y $\frac{4}{3}$



Thistle Gray

26 x 20, Lightweight, Substance No. 50



BANNOCKBURN COVER is manufactured as follows:

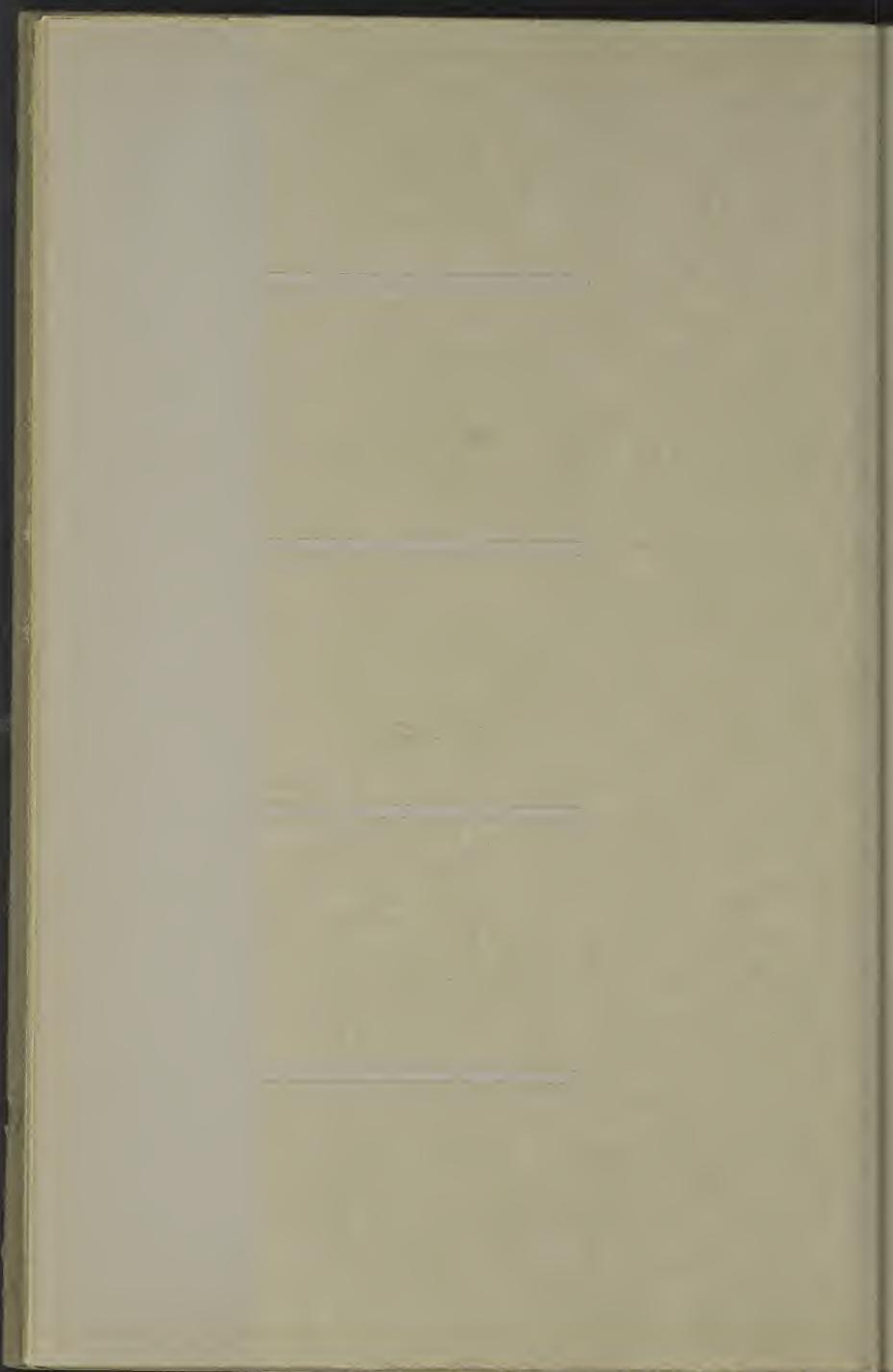
White and seven colors.

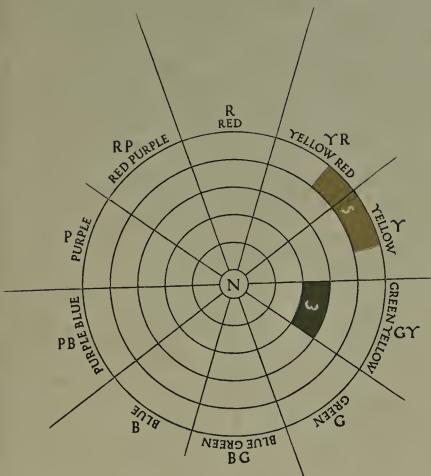
Lightweight, 26 x 20; Substance No. 50.

Heavyweight, 26 x 20; Substance No. 50 Pasted.

Deckle Edges and Grain 20 inch way of the sheet.
500 sheets to a ream.







THE colors printed on this sheet all lie within the field of hues bounded on one side by GREEN-YELLOW, and on the other by a line between YELLOW and YELLOW-RED.

On the flaps, the colors of the outer areas are all GREEN-YELLOW ranging from a medium value and strong chroma at the top, to a low value and weak chroma at the bottom. The inner areas are all of the intermediary hue— γ YELLOW, ranging from a high value and strong chroma at the top, to a slightly lower value and much weaker chroma at the bottom. The paper is of a hue between YELLOW and GREEN-YELLOW, high in value and weak in chroma.

Thus it may be seen that all of these colors are related by their proximity in the scale of hues.

The decorative design is printed in the colors of the second flap from the bottom, the positions of which in the scales of hue and chroma, are shown on the diagram above.

GY $\frac{4}{6}$

3Y $\frac{6}{7}$

GY $\frac{3}{5}$

3Y $\frac{6}{5}$

GY $\frac{3}{4}$

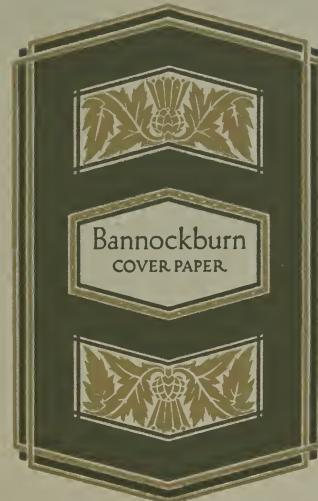
3Y $\frac{5}{5}$

GY $\frac{2}{3}$

3Y $\frac{4}{5}$

GY $\frac{2}{2}$

3Y $\frac{4}{3}$



Thistle Gray

26 x 20, Lightweight, Substance No. 50



BANNOCKBURN COVER is manufactured as follows:

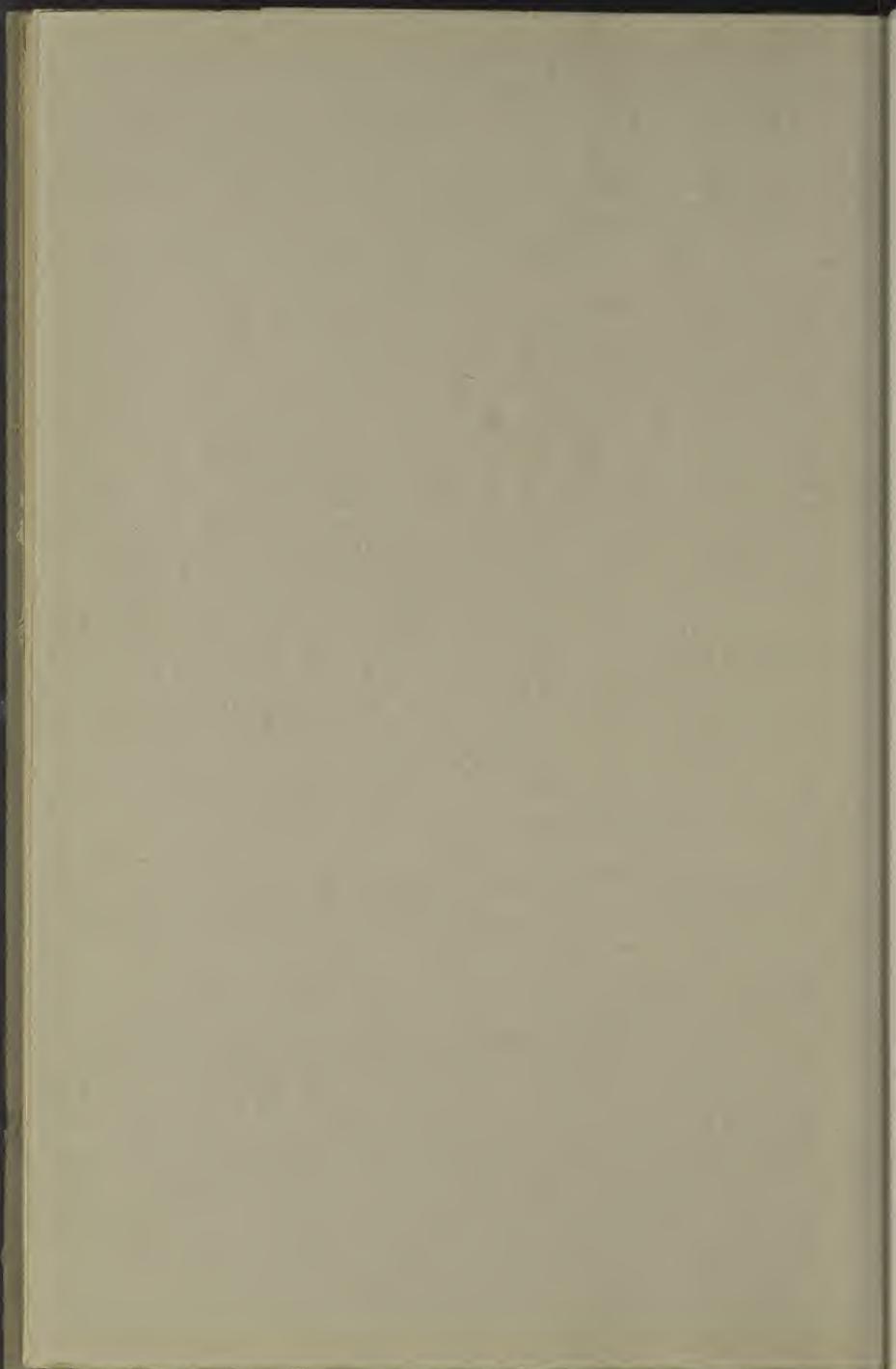
White and seven colors.

Lightweight, 26 x 20; Substance No. 50.

Heavyweight, 26 x 20; Substance No. 50 Pasted.

Deckle Edges and Grain 20 inch way of the sheet.
500 sheets to a ream.





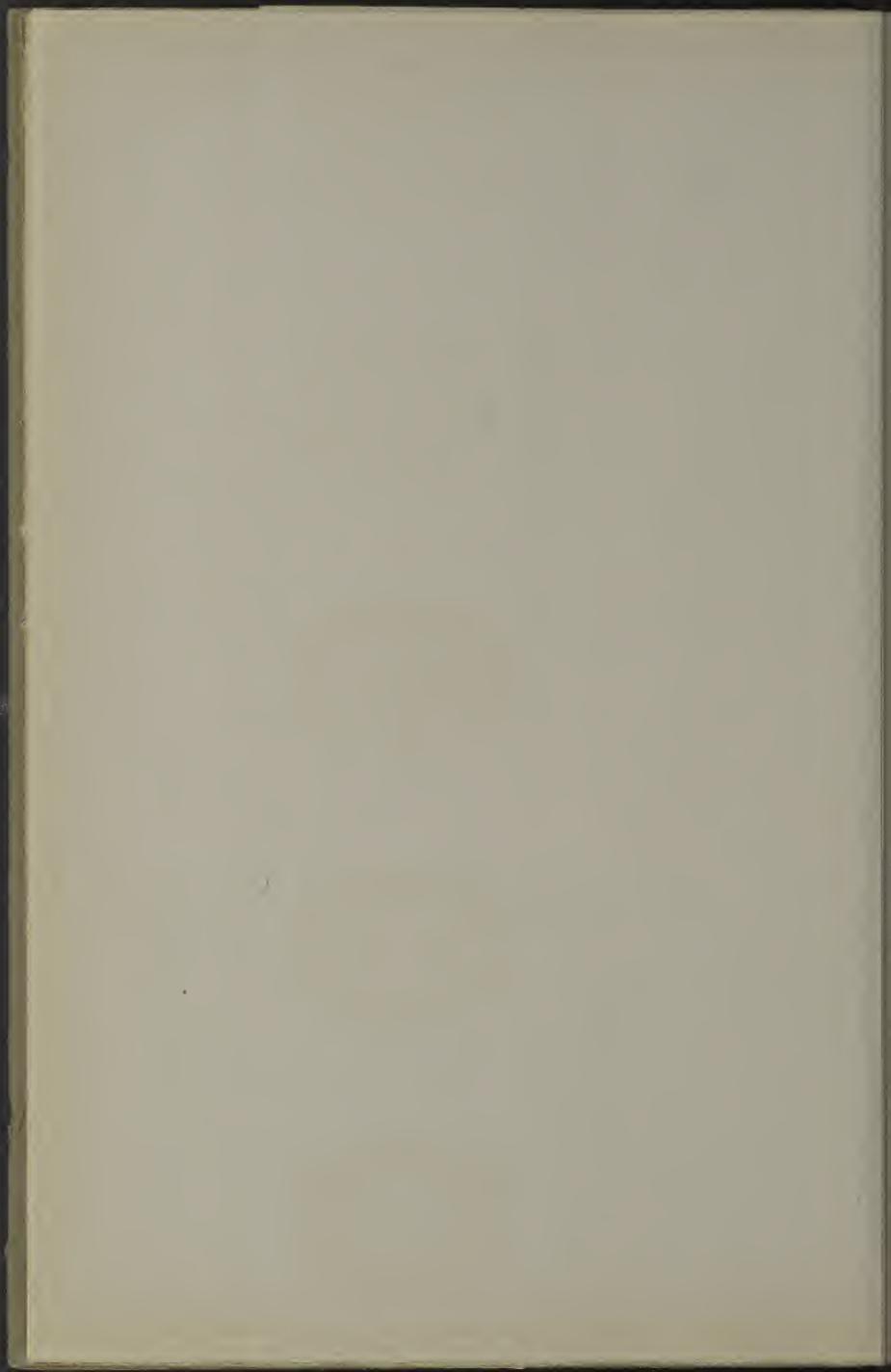
Sheer 15



Millcraft Cover

Green

Antique Finish





GY 6/8

G 2/3



GY 5/7

G 3/5



GY 3/5

4G 3/6

This is the result of wide



7Y 3/4

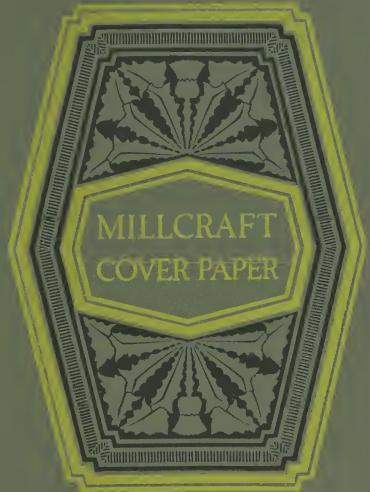
4G 4/6

THE CHROMA AND VALUE



7Y 2/2

3G 4/6



Green, Antique Finish

26 x 40, 130 lbs., Substance No. 65



MILLCRAFT Covers are manufactured as follows:

White and six colors.

26 x 40, 80 lbs., Substance No. 40.

26 x 40, 130 lbs., Substance No. 65.

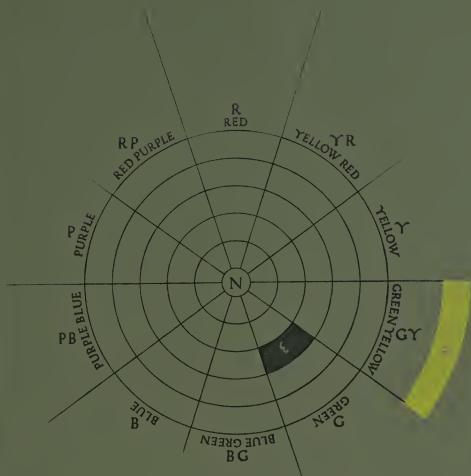
26 x 40, Heavyweight, Substance No. 65 Pasted.

Deckle Edges and Grain are 40 inch way of the sheet, 500 sheets to a ream.

Special Finishes can be supplied in
5 ream lots of a color.







ALL of the colors on this sheet lie within the GREEN to YELLOW field of hues. The hue of the paper lies within the same field at approximately 3 GREEN. The relation of the paper and the printed colors is established, in this example, by proximity of hue rather than by opposition. Such contrast as appears is the result of wide variations of value and chroma.

The colors of the outer areas, printed on the flaps, range from a high value and strong chroma of GREEN-YELLOW at the top, to a very low value and weak chroma of 7 YELLOW at the bottom. In the inner areas they range from a very low value of GREEN at the top, to a medium value and strong chroma of 3 GREEN at the bottom.

The decorative design is printed in the colors of the top flap — G-Y 6/8 and G 2/3. The chroma and value of G-Y 6/8 being much greater than that of G 2/3, it occupies proportionately less area. The positions of these two colors in the scales of hue and chroma are shown on the diagram above.

GY 6/8

G 2/3

GY 5/7

G 3/5

GY 3/5

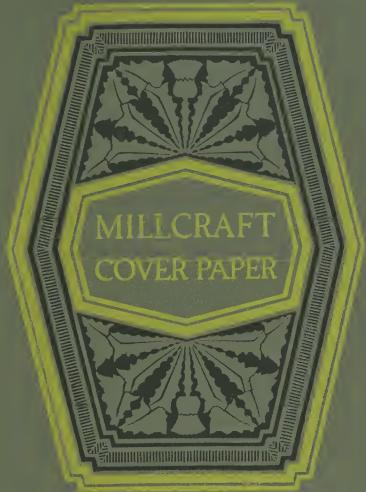
4G 3/6

7Y 3/4

4G 4/6

7Y 2/2

3G 4/6



MILLCRAFT COVER PAPER

Green, Antique Finish

26 x 40, 130 lbs., Substance No. 65



MILLCRAFT COVERS are manufactured as follows:

White and six colors.

26 x 40, 80 lbs., Substance No. 40.

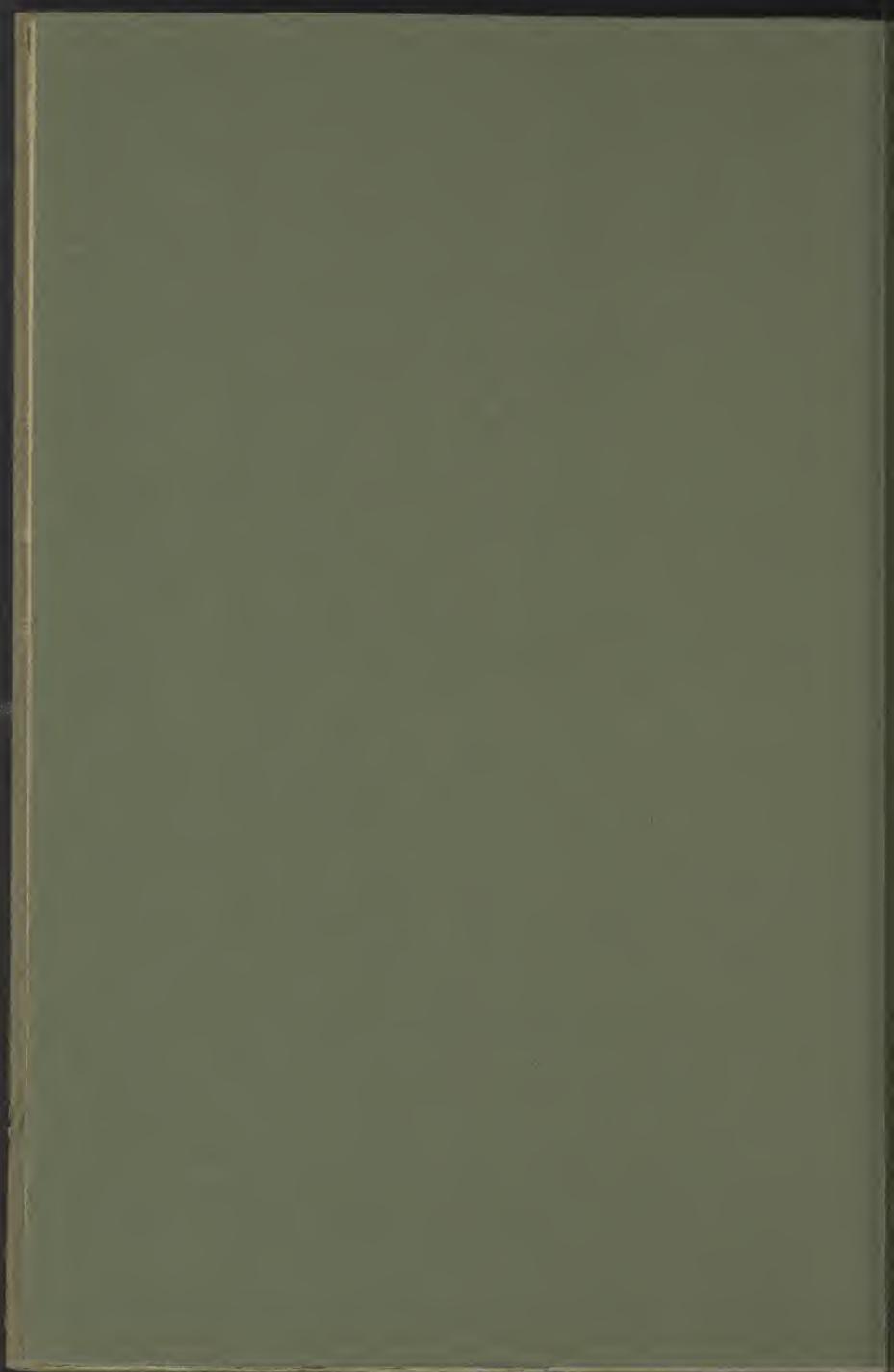
26 x 40, 130 lbs., Substance No. 65.

26 x 40, Heavyweight, Substance No. 65 Pasted.

Deckle Edges and Grain are 40 inch way of the sheet. 500 sheets to a ream.

Special Finishes can be supplied in
5 ream lots of a color.



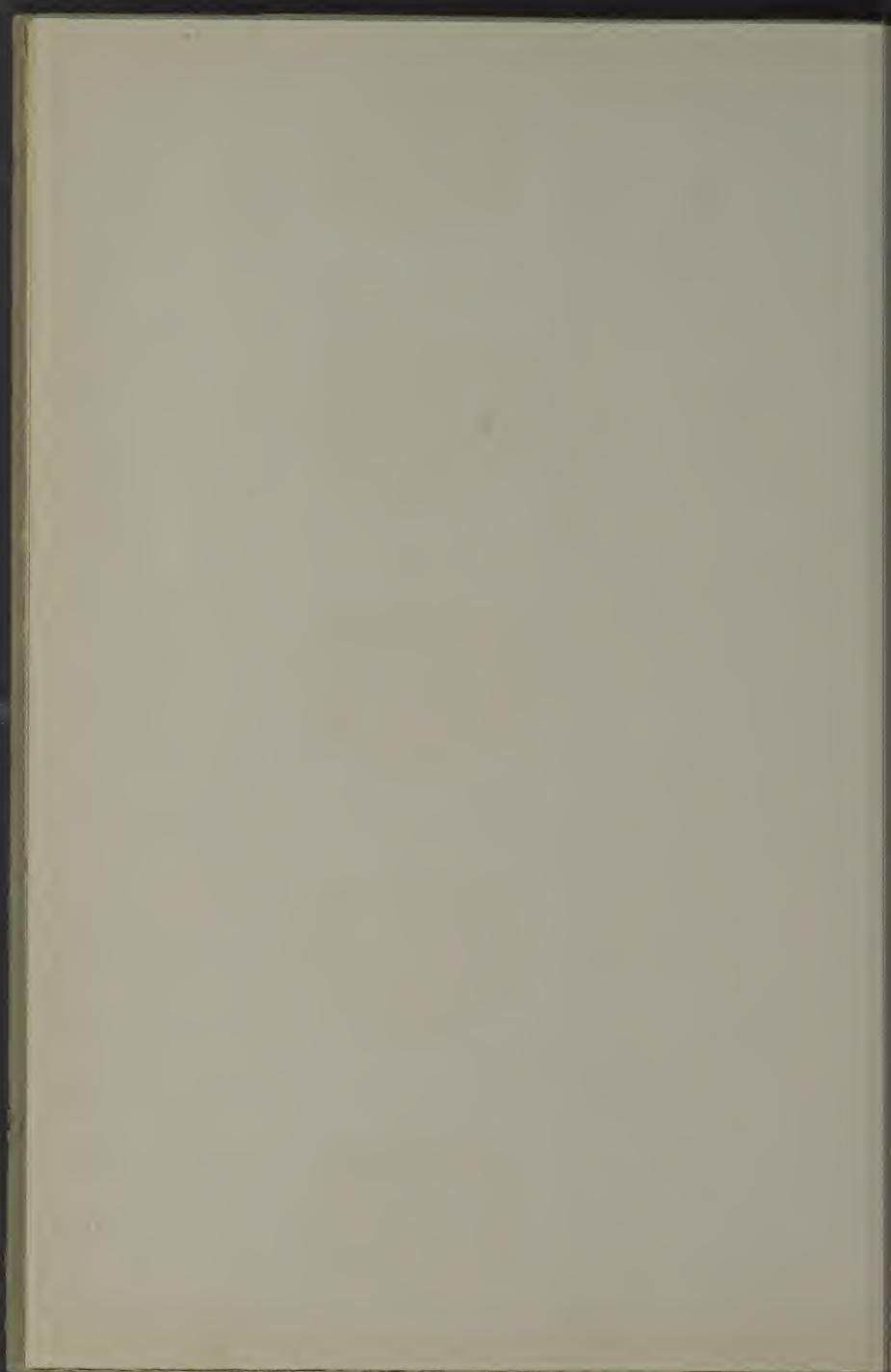


7

Rhododendron Cover

Woods Green

Antique Finish





BG 2/3

R 3/8



BG 5/8

R 3/8



BG 4/4

R 4/5



BG 3/5

R 4/3



BG 2/3

R 4/2



Woods Green, Antique Finish
65 lbs., Substance No. 65



RODODENDRON COVERS are manufactured as follows:

White and twelve colors.

20 $\frac{1}{2}$ x 26, 35 lbs., Substance No. 35.
20 $\frac{1}{2}$ x 26, 65 lbs., Substance No. 65.
20 $\frac{1}{2}$ x 26, Heavy weight, Substance No. 65. Pasted.

Antique and Telanian Finishes.

Deckle Edge, and Grain long way of sheet,
500 sheets to a ream.

*Special finishes can be supplied in
5 ream lots of a color.

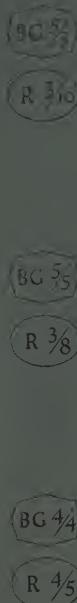




THIS colors printed on this sheet are of two directly opposite hues, BL-U-E-GREEN and RED.

The colors of the outer areas, on the flaps, are all of the same hue, BL-U-E-GREEN, ranging from a medium value and weak chroma at the top to a low value and weak chroma at the bottom, with but slight variations in the dimension of chroma. The colors of the inner areas are all RED in hue and vary only slightly in the dimension of value, but cover a wide range of chroma.

The decorative design is printed in the colors of the bottom flap—R-G₂/₃ and R₄/₂, the positions of which, in the scales of hue and chroma, are shown on the above diagram.



Woods Green, Antique Finish
65 lbs., Substance No. 65



RHODODENDRON COVERS are manufactured as follows:

White and twelve colors.

20¹/₂ x 26, 75 lbs., Substance No. 35.

20¹/₂ x 26, 65 lbs., Substance No. 65.

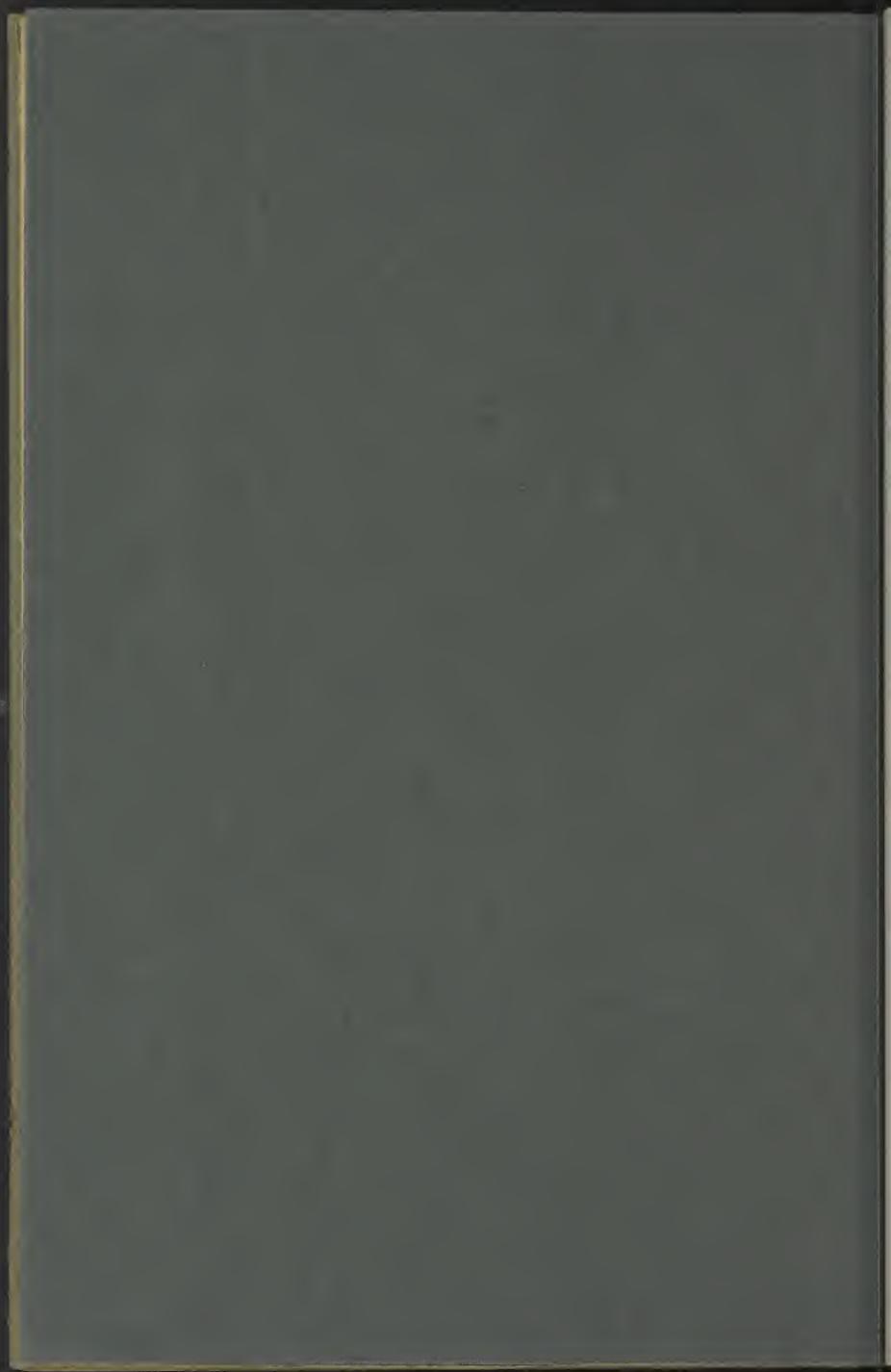
20¹/₂ x 26, Heavyweight, Substance No. 65 Pasted.

Antique and Telanian Finishes.

Double Edges and Grain long way of sheet,
500 sheets to a ream.

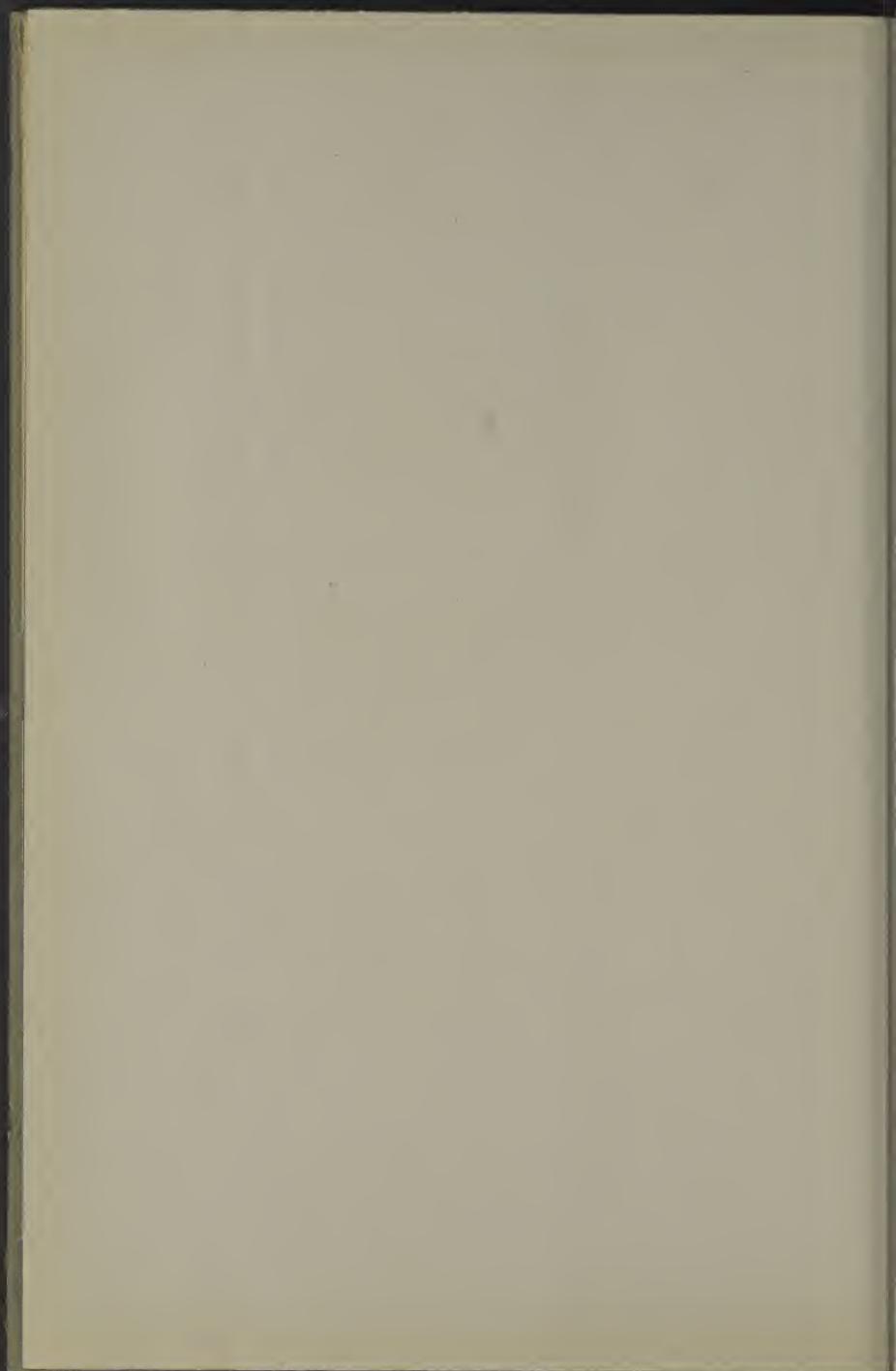
Special finishes may be supplied in
5 ream lots of a color.







Strathlaid Booklet Paper
Green





G 4/1

RP 4/5



G 4/2

RP 4/4



G 4/3

RP 4/3



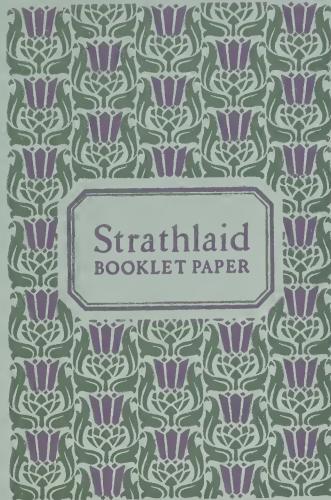
G 4/5

RP 4/2



G 4/6

RP 4/1



Strathlaid
BOOKLET PAPER

Green, 25½ x 40, Coverweight.

STRATHLAI^D BOOKLET PAPERS are manufactured
as follows:

White and four colors.

Bookweight, 25½ x 40.

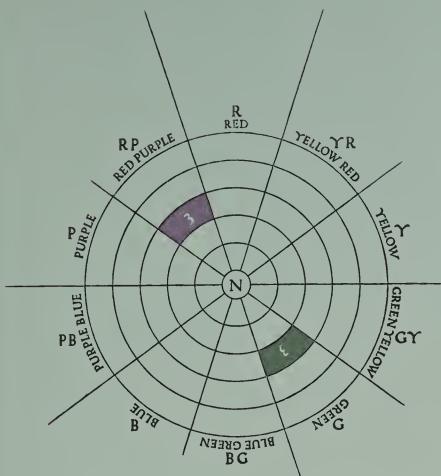
Coverweight, 25½ x 40.

Deckle Edges, Marking and Grain 40-inch way of
the sheet.

500 sheets to a ream.







THE colors printed on this sheet are of hues directly opposite to each other, as shown on the above diagram, i.e., GREEN and RED-PURPLE.

The colors on the flaps are all of the same value, and vary only in the dimension of chroma. In the outer areas they range from a strong chroma of GREEN at the bottom to a weak chroma of GREEN at the top; and in the inner areas, from a strong chroma of RED-PURPLE at the top to a weak chroma of RED-PURPLE at the bottom.

The areas are proportioned according to the strength of chroma in each, upon the principle that the color of strong chroma should occupy less area than the color of weak chroma.

The decorative design is printed in the colors of the middle flap, the positions of which, in the scales of hue and chroma, are shown on the diagram above.

The paper is GREEN of a high value and weak chroma.

G 4½

RP 4½

G 4½

RP 4¼

G 4¾

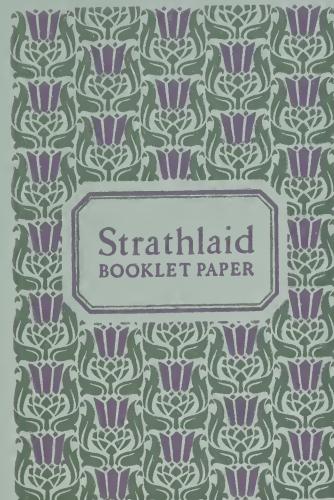
RP 4¾

G 4½

RP 4½

G 4¾

RP 4⅓



Green, 25½ x 40, Coverweight.



STRATHLAIID BOOKLET PAPERS are manufactured as follows:

White and four colors.

Bookweight, 25½ x 40.

Coverweight, 25½ x 40.

Deckle Edges, Marking and Grain 40-inch way of the sheet.

500 sheets to a ream.



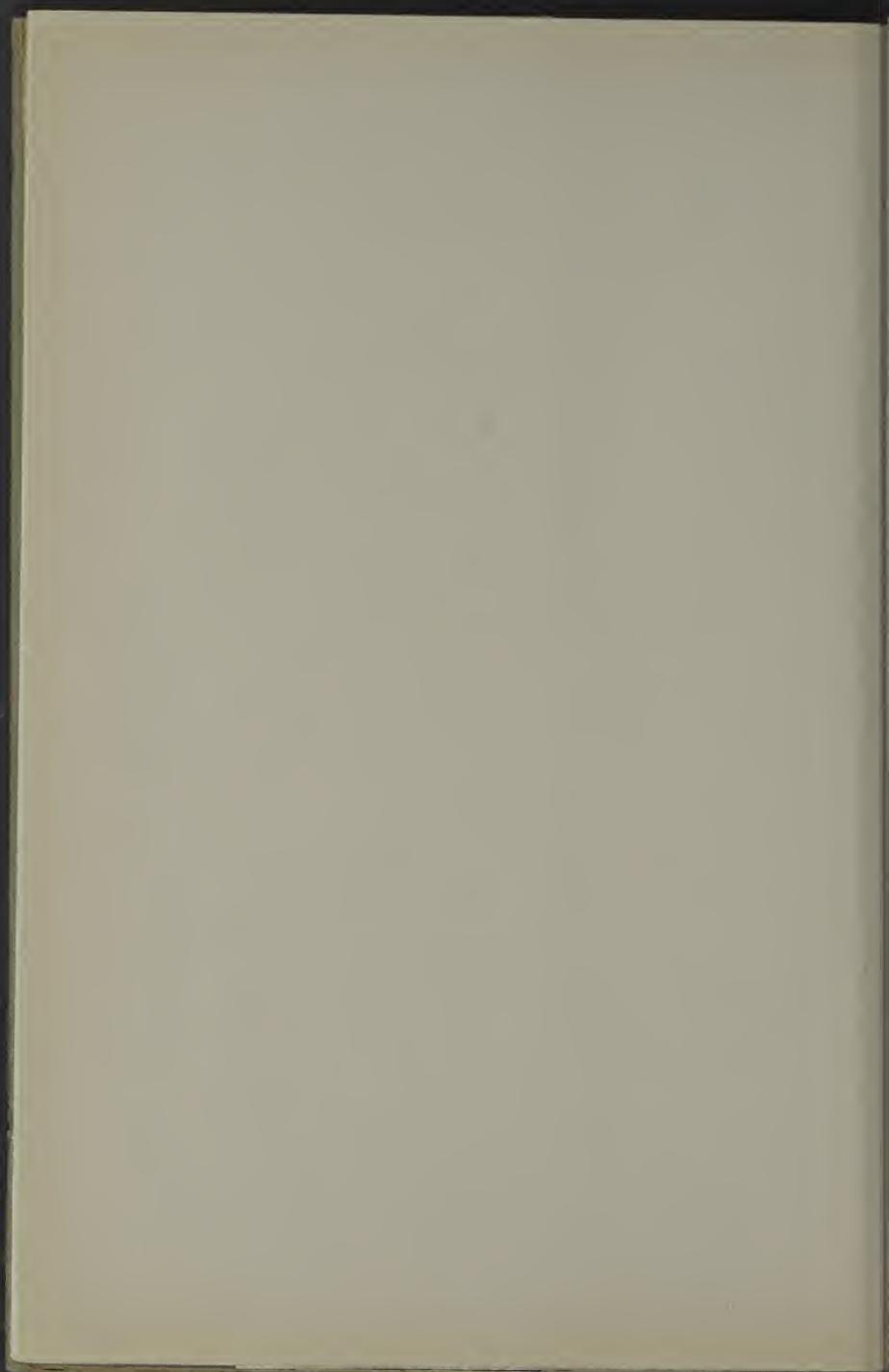




Bay Path Cover

Blue

Ripple Finish





Y 4/6

PB 4/5



Y 5/7

PB 4/8



Y 5/8

2P 3/7



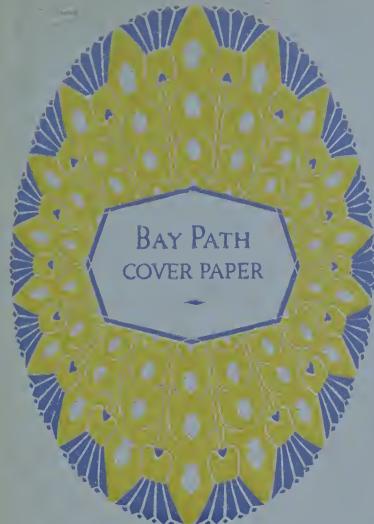
Y 6/7

PB 2/3



Y 6/8

2P 2/4



Blue, Ripple Finish

20 x 26, 65 lbs. Substance No. 65



BAY PATH Covers are manufactured as follows:

White and seven colors.

Antique and Ripple Finishes.

Substance No. 40 26 x 40 80 lbs.

Substance No. 50 26 x 40 100 lbs.

Substance No. 65 20 x 26 65 lbs.

23 x 33 95 lbs.

Substance No. 80 20 x 26 80 lbs.

23 x 33 117 lbs.

Sub. No. 65 Pasted 20 x 26 Heavyweight.

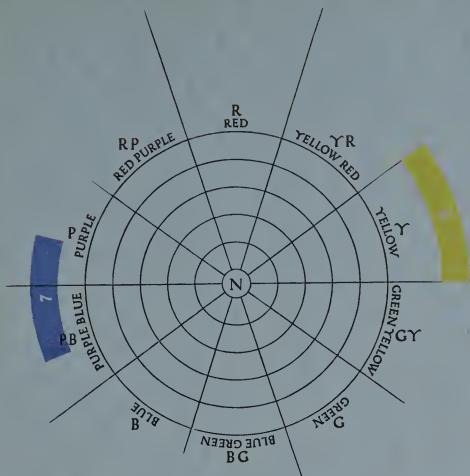
23 x 33 Heavyweight.

Plain Edges. 500 sheets to a ream.

Special finishes can be supplied in
5 ream lots of a color







THE colors printed on this sheet lie in opposite fields of hue and are balanced or harmonized by contrast.

The colors of the outer areas on the flaps are all YELLOW in hue, ranging from a medium value and chroma at the top to a higher value and strong chroma at the bottom. In the inner areas, all are PURPLE-BLUE in hue except two, which are intermediary hues, known as 2 PURPLE, being two steps away from PURPLE-BLUE in the direction of PURPLE. They range from a medium value and chroma at the top to a low value and slightly weaker chroma at the bottom, by irregular steps.

The decorative design is printed in the colors of the middle flap— $Y\frac{5}{8}$ and $2P\frac{3}{7}$, the positions of which, in the scales of hue and chroma are shown on the above diagram.

$Y\frac{4}{6}$

$PB\frac{4}{5}$

$Y\frac{5}{7}$

$PB\frac{4}{8}$

$Y\frac{5}{8}$

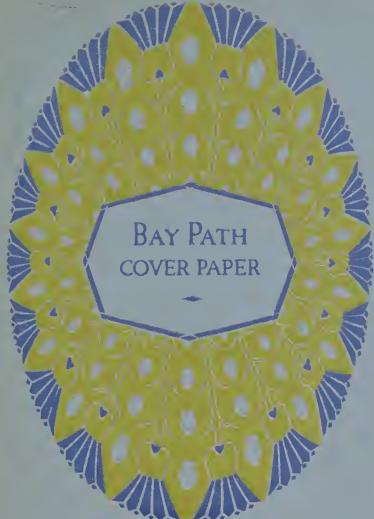
$2P\frac{3}{7}$

$Y\frac{6}{7}$

$PB\frac{2}{3}$

$Y\frac{6}{8}$

$2P\frac{2}{4}$



Blue, Ripple Finish

20 x 26, 65 lbs. Substance No. 65



BAY PATH COVERS are manufactured as follows:

White and seven colors.

Antique and Ripple Finishes.

Substance No. 40 26 x 40 80 lbs.

Substance No. 50 26 x 40 100 lbs.

Substance No. 65 20 x 26 65 lbs.

23 x 33 95 lbs.

Substance No. 80 20 x 26 80 lbs.

23 x 33 117 lbs.

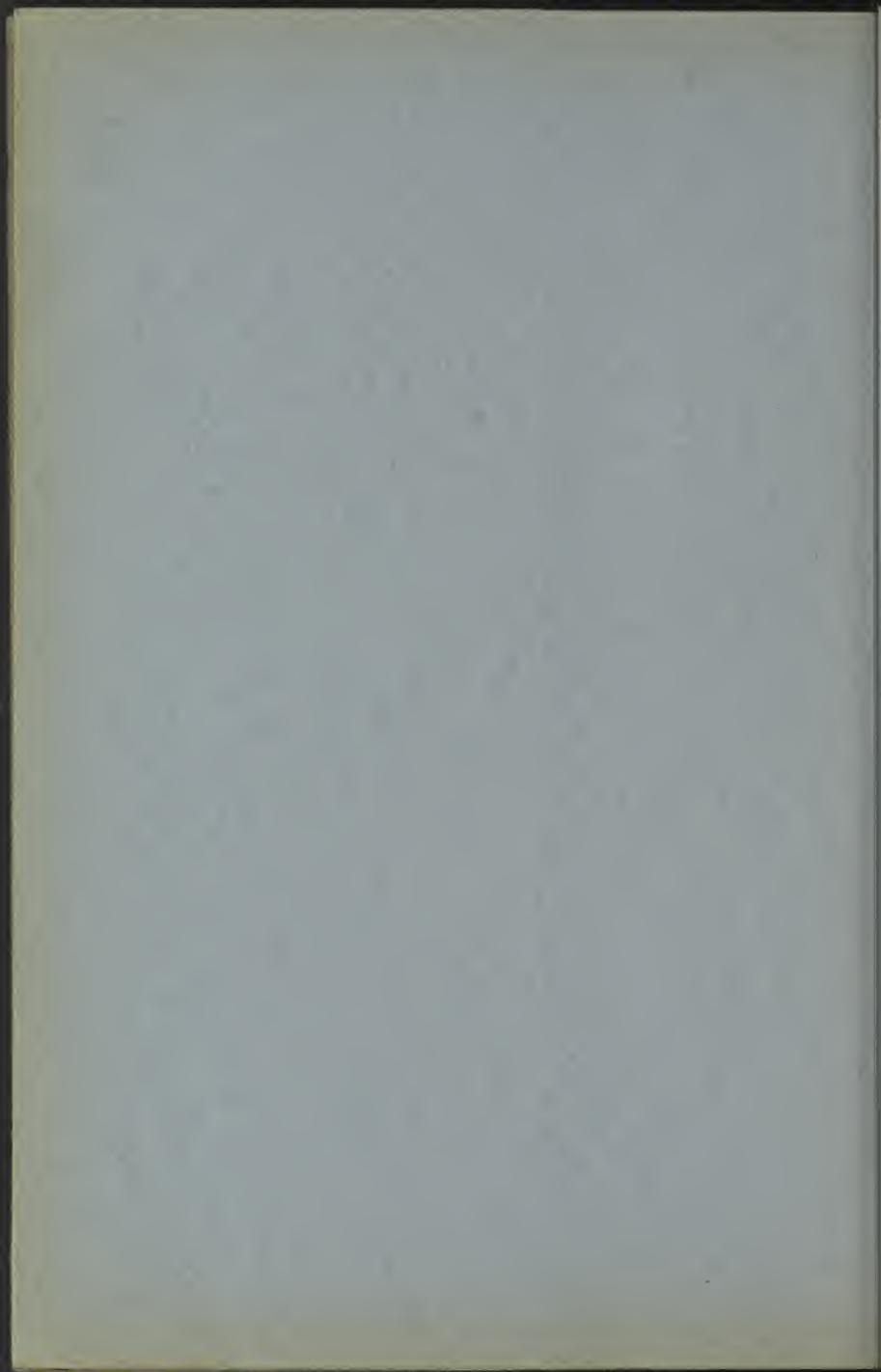
Sub. No. 65 Pasted 20 x 26 Heavyweight.

23 x 33 Heavyweight.

Plain Edges. 500 sheets to a ream.

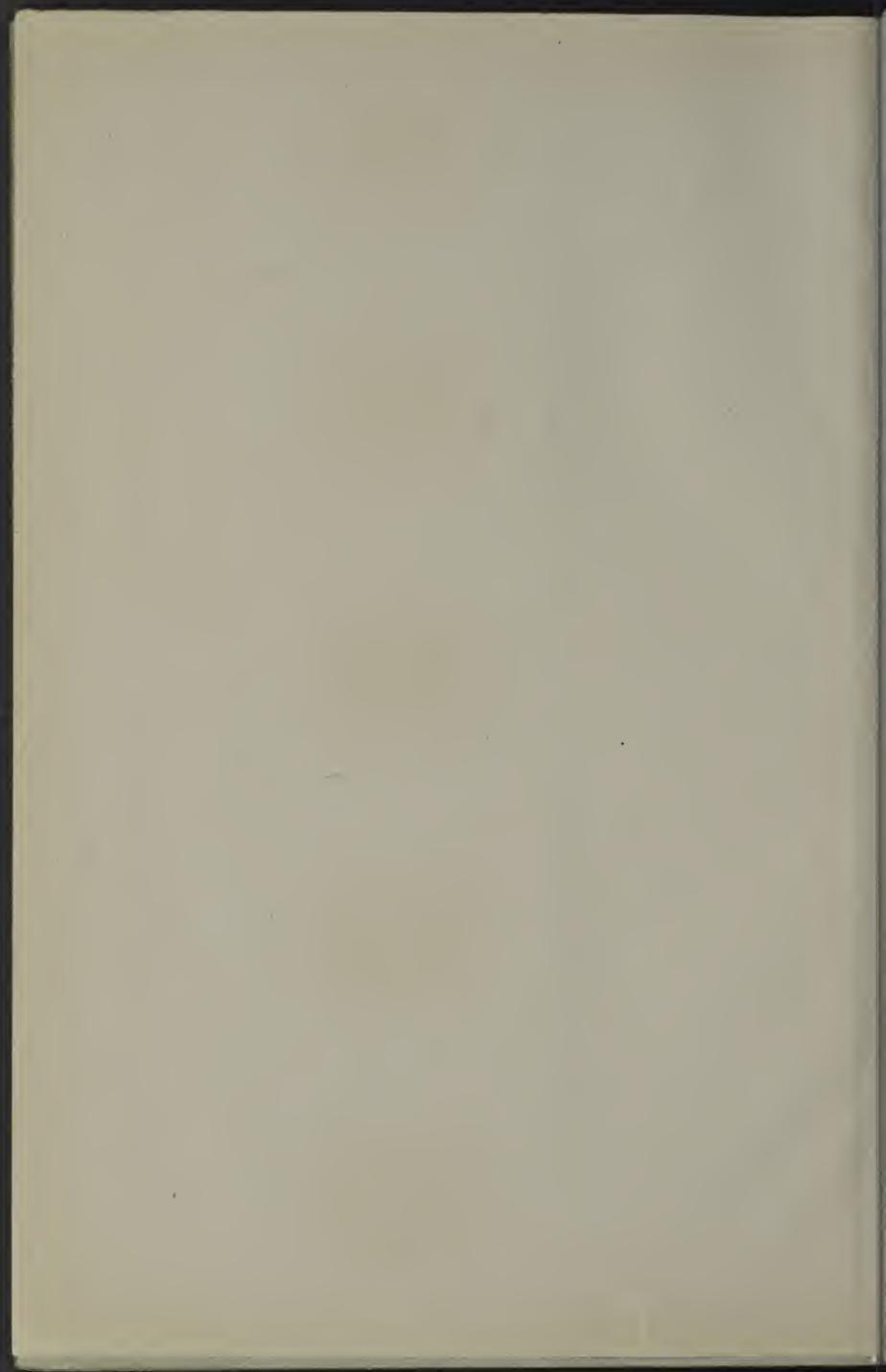
Special finishes can be supplied in
5 ream lots of a color







Strathlaid Booklet Paper
Blue





6B 4/1

YR 3/4



6B 4/2

YR 3/5



6B 4/3

YR 3/6



6B 4/4

YR 2/4



6B 4/5

YR 2/3



Blue, 25 1/2 x 40, Coverweight

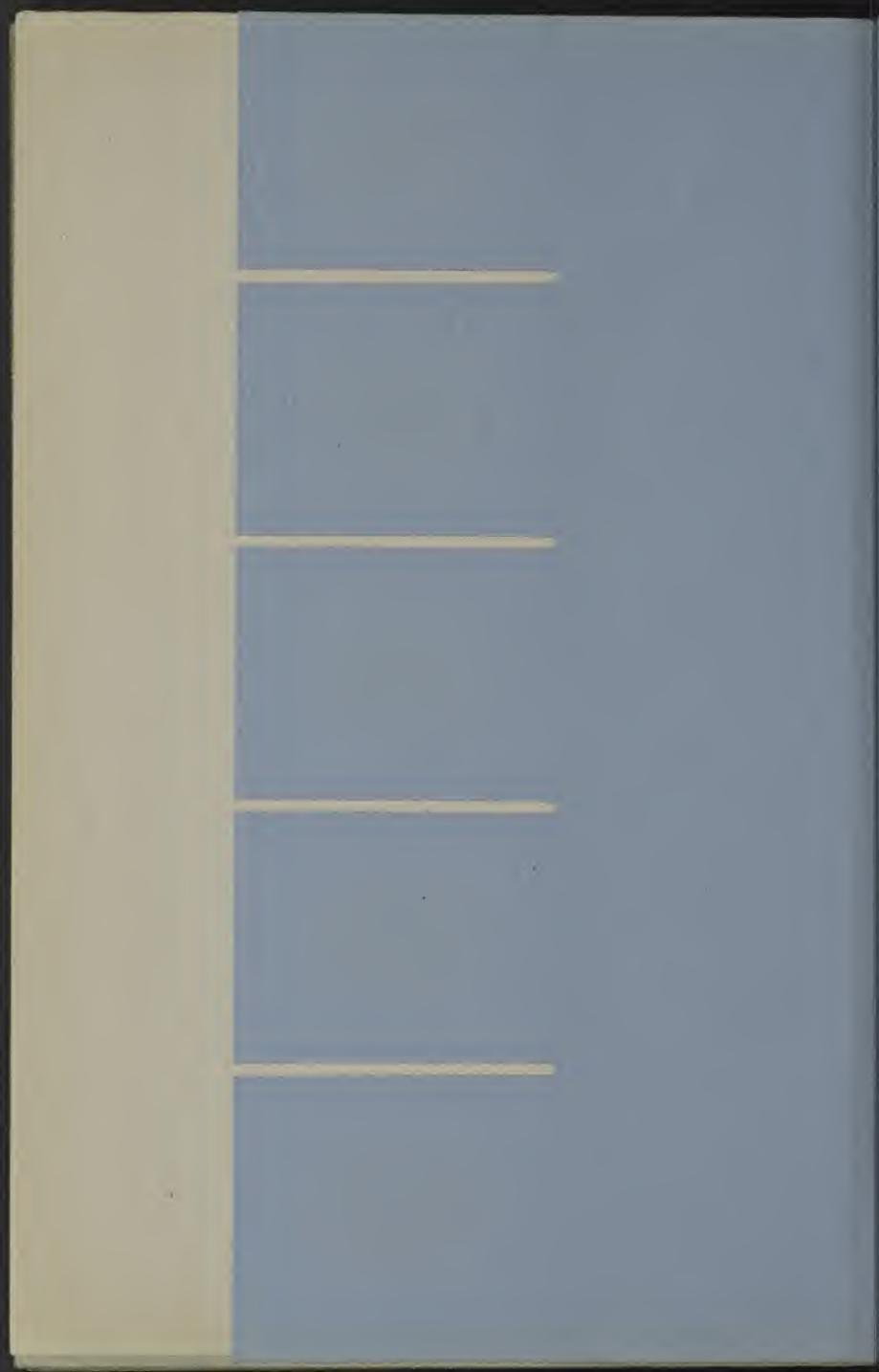
STRATHLAI^D BOOKLET PAPERS are manufactured
as follows.

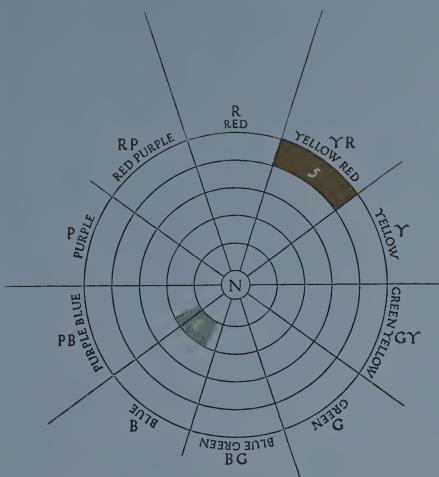
White and four colors.

Bookweight, 25 1/2 x 40.
Coverweight, 25 1/2 x 40.

Deckle Edges, Marking and Grain 40-inch way of
the sheet.
500 sheets to a ream.







THE colors printed on this sheet are of hues nearly, but not quite opposite to each other.

The colors of the outer areas on the flaps are all of the same hue as the paper, that is, 6 BLUE, which is a blue that encroaches by one intermediary step upon the PURPLE-BLUE field. They are all of the same value and differ only in chroma. In the inner areas the colors are low values of YELLOW-RED of varying chromas.

The decorative design is printed in the colors of the second flap from the top, the positions of which in the scales of hue and chroma are shown on the diagram above.

6B 4₁

YR 3₄

6B 4₂

YR 3₅

6B 4₃

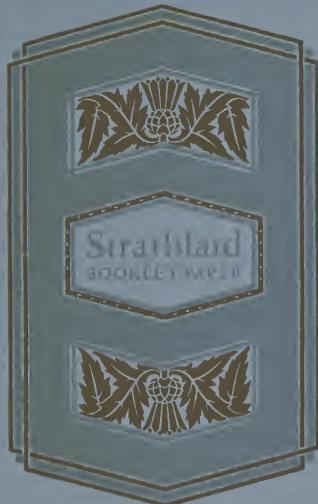
YR 3₆

6B 4₄

YR 2₄

6B 4₅

YR 2₃



Blue, 25 $\frac{1}{2}$ x 40, Coverweight



STRATHLAIID BOOKLET PAPERS are manufactured as follows.

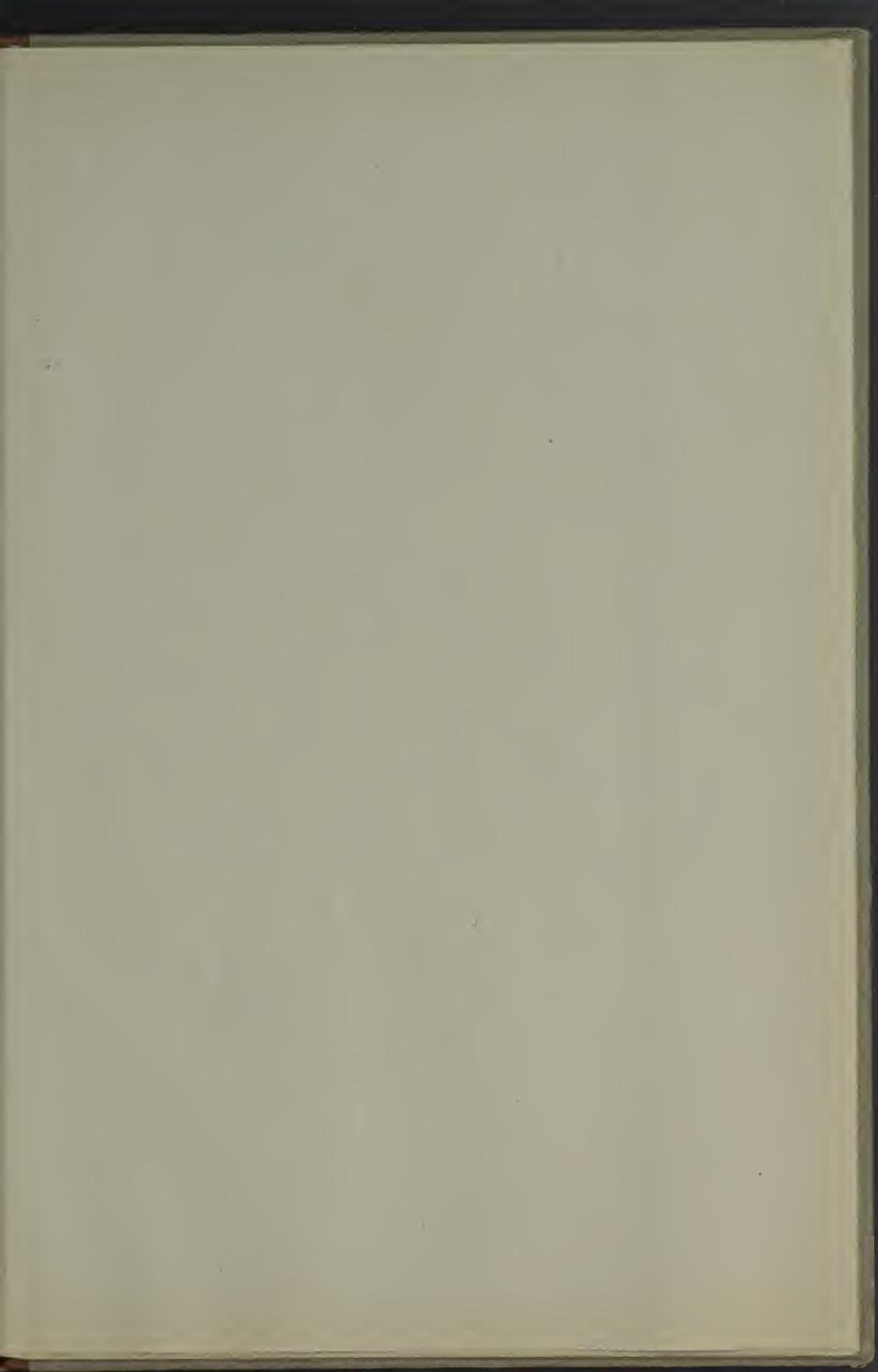
White and four colors.

Bookweight, 25 $\frac{1}{2}$ x 40.
Coverweight, 25 $\frac{1}{2}$ x 40.

Deckle Edges, Marking and Grain 40-inch way of the sheet.
500 sheets to a ream.











86-B7115

Special
File
No B7115

